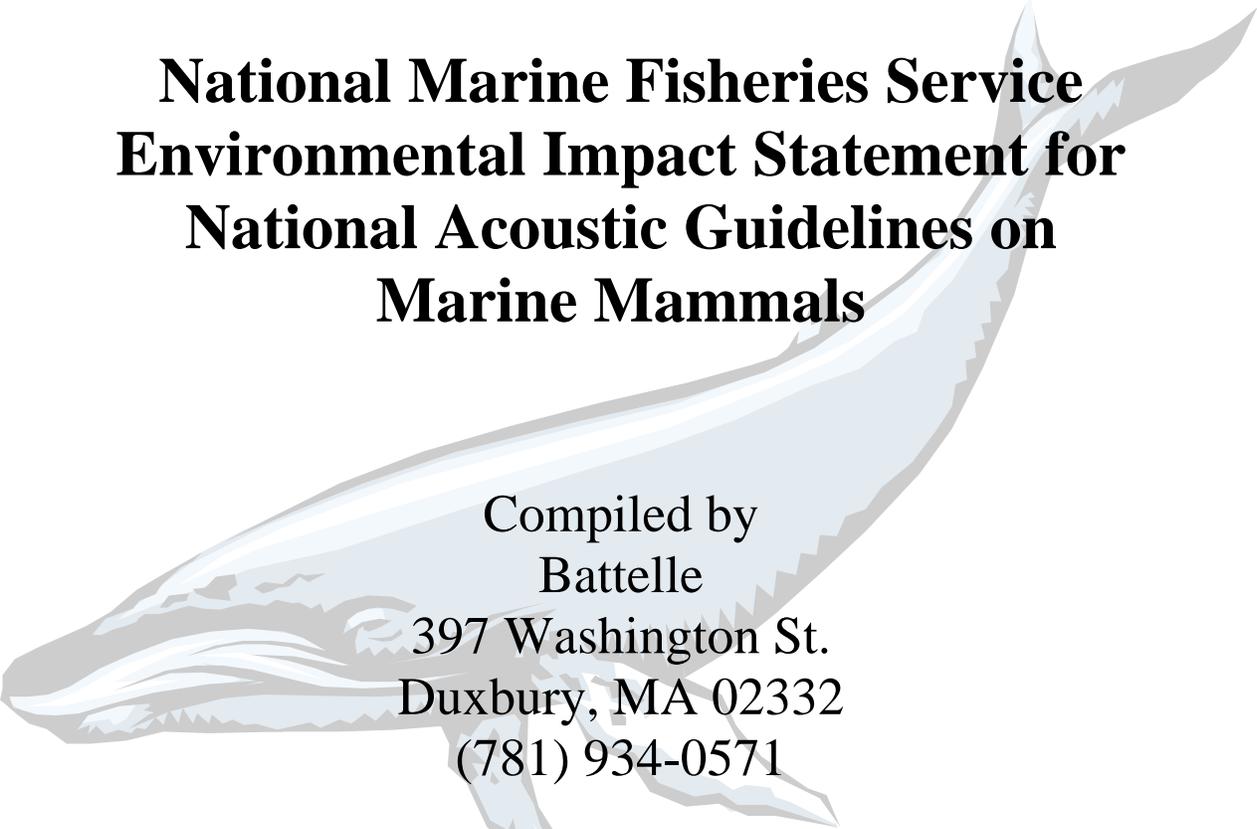


Scoping Report

for the

**National Marine Fisheries Service
Environmental Impact Statement for
National Acoustic Guidelines on
Marine Mammals**



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Introduction

The National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA) published a Notice of Public Scoping and Intent to Prepare and Environmental Impact Statement (NOI) on Tuesday January 11, 2005 (Appendix A). This was the first step in a series to begin work on an EIS that will examine potential impacts of implementing recently developed noise exposure criteria in guidelines to determine what constitutes an acoustic “take” of a marine mammal under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA). Additional steps taken during the scoping period included holding four scoping meetings throughout the country and collecting and reviewing public comments received. This document summarizes the information collected during scoping.

EIS Background Information

The noise exposure criteria will be science-based, and directed to improve and replace the generic exposure level thresholds that have been used since 1997 as the basis for Level A harassment (potential to injure) and Level B harassment (behavioral disruption) acoustic “takes” for all species and all types of sounds worldwide. NMFS proposes to replace the older thresholds with exposure characteristics that are derived from empirical data and are tailored to particular species groups and sound types, providing better scientific basis for determining whether takes would occur. These criteria, to be implemented through agency guidelines, would define the level of an acoustic “take” for industry (oil and gas, marine construction, etc.), researchers, academic, government and military activities.

The exposure criteria values would become criteria that NMFS would use, at least in part, to define when an acoustic “take” occurs under the MMPA or ESA for each of the different marine mammal hearing groups.

Due to the level of uncertainty about the impacts of anthropogenic noise on marine mammals, NMFS has decided that applying the noise exposure criteria as a starting point in developing agency guidelines for what constitutes a “take” could have significant environmental impacts and thus requires the preparation of an EIS in accordance with the National Environmental Policy Act (NEPA).

Scoping Meetings Summary

During the scoping period (January 11, 2005 – March 14, 2005), comments were collected regarding the EIS during public meetings and through e-mail, fax, and mail. Table 1 shows the meeting locations, dates and times, along with number of attendees, for the four public scoping meetings.

Table 1. Acoustic EIS Scoping Meetings

Location	Date/Time	Attendance
San Francisco, California Hilton Fisherman's Wharf	January 18, 2005, 5:00pm – 7:00pm.	19
Seattle, Washington NOAA's Western Regional Center	January 20, 2005, 5:00pm – 7:00pm	39
Boston, Massachusetts New England Aquarium Education Center	January 25, 2005, 5:00pm – 7:00pm	6
Silver Spring, Maryland, NOAA Auditorium	January 27, 2005, 5:00pm – 6:30pm	47

Each scoping meeting began with a NMFS representative giving a PowerPoint presentation, which provided the audience with background information on the National Environmental Policy Act (NEPA), MMPA and ESA, the process that is followed when developing an EIS, NMFS acoustic permitting responsibilities, and the alternatives under consideration. Following this presentation, the floor was opened for statements and comments. Throughout the four meetings, several groups and members of the public asked questions or made statements. Participants were:

- American Cetacean Society
- Center for Regulatory Effectiveness
- Cetacean Research Technology
- Earth Island Institute
- Fugro Pelagos Inc.
- Global Research and Rescue
- Massachusetts Port Authority
- Natural Resources Defense Council (NRDC)
- Seaflow
- Orca Alliance
- Orca Relief
- Perot Systems Government Services
- SAIC
- The Humane Society of the United States
- Turner Collie & Bradden
- University of Washington

Appendix B contains meeting summaries for each of the scoping meetings.

The following is a list of common questions raised at the four scoping meetings:

Alternatives

- How are Level A and Level B defined and what is the relation between the two with respect to how the alternatives were defined?

Acoustic Data, Analysis, Criteria, Other Noise Considerations

- How were the new criteria developed? What is the NMFS science panel doing and what is the Marine Mammal Commission doing and how are those related?
- Which species are data being extrapolated for? Which species and what types of studies are providing the basis of information used to devise the criteria?
- How are ambient noise levels established and how will they be determined?
- How is sonar treated in acoustic guidelines? Is sonar a pulse or continuous sound source?

General

- How will the new guidelines be implemented? Will they be mandatory? Will they apply in International waters?
- In developing the guidelines did NMFS consider effects on species other than marine mammals?
- Do the new proposed acoustic guidelines take into account what a marine mammal is doing at the time of exposure?
- Are the guidelines based on noise received at the animal or from where the noise is propagated?
- How would the shipping industry be affected by the new guidelines?
- How would the new acoustic guidelines be applied in a permit situation?
- How would routine navigation and bathymetric work be affected by the guidelines?
- What is the definition of temporary threshold shift and how was that factor determined?
- Would vessels be individually permitted based on travel patterns and possible interactions with different species?

Other Studies

- What is known about stranding and noise?

The following is a list of public suggested recommendations/considerations in regards to the EIS and NMFS actions from the scoping meetings:

Alternatives

- Management decisions should be made on an ecosystem basis instead of select species.
 - An alternative should be included that limits acceptable noise levels to simple 120db or below for pulses and 100db or below for continuous, non-pulse noise sources.
-

Acoustic Data, Analysis, Criteria, Other Noise Considerations

- Using energy-flux density is important when considering sound effects as it incorporates time, direction, and proximity.
- Even though many species can be grouped in similar classes from a hearing standpoint, species within a group can behave markedly different to noise.

Indirect, Long-term, and Cumulative Effects

- Indirect impacts on a species to noise other than hearing damage (i.e., behavioral changes) need to be assessed.

General

- NMFS needs to consider how its new guidelines are going to cause delays or increase costs borne by agencies, industries, or education institutions when preparing to work on the ocean conducting surveys like routine hydrographic surveys.
- Exposure levels are being based on temporary threshold shifts which may not address low levels of sound that cause stranding.
- The science panel's meetings were not open to the public.

Summary of Comments

Three letters, two faxes and 45 e-mails were received regarding the public scoping period (written comments are reprinted in Appendix C). Several comments were received in duplicate (i.e., e-mailed, faxed, and mailed). Duplicate comments were compiled into one comment. Commenters include a combination of 29 individuals and groups representing the general public, ten non-government organizations (NGOs), five private interest groups, three academic institutions, two federal agencies, and one state agency. A summary of the types of comments received is listed below. Appendix D contains all the comments received, organized by subject matter.

Scoping

- Why were no scoping meetings held along the Gulf Coast, in Alaska or near New York City?
- Short notice was provided for the scoping meetings.
- The Federal Register did not provide enough information for commenting on the scoping process.
- The EIS has a broad scope and fails to clarify the nature of the agency's action.
- NMFS needs to include the USFWS in the NEPA process and development of the noise guidelines due to ESA.
- The EIS must clearly state what user groups will be subject to the new guidelines and which groups will be exempt.

Alternatives

- Best available science should be used in developing alternatives.
-

- Clarifications need to be made in regards to defining Level A and Level B harassment. Additional clarification needs to be made on the 50 percentile determination for behavioral avoidance/harassment.
- Clarification needs to be made on how the data will be extrapolated; including statements of limitations.
- References given to the “status quo” is a concern as no single “status quo” criteria seems to exist.
- What is the justification for including only TTS and PTS in the criteria Level B harassment?
- Alternative I is insufficiently protective. Lower levels of noise can cause Level B behavior changes. Alternative I would perpetuate the use of the existing thresholds for Level A and Level B harassment.
- Alternative II appears to be precautionary, concerns remain about how it will monitor and enforced. Alternative II appears to be a "zero tolerance" option as the thresholds for both Level A and Level B harassment would result in a "take" in every instance. Is it over-protective?
- Alternatives III through VI are insufficiently protective. A noise level of 105 dB is sufficient to cause behavioral changes, and that is far below the 160 dB and above levels envisioned in these alternatives. The criterion for Level A is 155-165 dB to 181-191 dB above threshold for mid-frequency cetaceans. A noise the same number of dB above threshold for a human would be far above the pain threshold.
- Alternatives III through V contain acoustic criterion primarily focused on temporary threshold shifts (TTS) or permanent threshold shifts (PTS). TTS and PTS are physiological responses of marine mammals to noise, and do not address behavioral responses (with the exception of Level B criterion for Alternative III, which indicates 50% behavioral avoidance).

Acoustic Data, Analysis, Criteria, Other Noise Considerations

- All extrapolations, uncertainties and unknowns should be made explicit in the development of the criteria. The development of the criteria calls for a large amount of extrapolation and the use of very limited data sets. How will this be reconciled?
 - Establishing permissible noise thresholds based on pitch and amplitude-weighted audiograms is probably omitting some important acoustical perceptions that fish have (and mammals are not adapted to).
 - Noise criteria should be based on ecosystem considerations, not just focused individual species responses. In order to be useful for regulatory purposes, the acoustic criteria should focus on assessment and regulation of acoustic effects on marine mammals at the population or stock level.
 - Impacts of noises on fish and marine invertebrates should be included; synergistic and cumulative affects on marine animals; “energy flux density” and have provisions for other energy-time-domain integration.
 - Effects of masking appear not to be covered in the description of Level B harassment. But masking could well be a significant effect for some noise
-

- sources, particularly for noise sources that persist for weeks to months like shipping, drilling and production of oils and gas, wind farms, etc.
- Is any provision made for other measures such as the nature of the sound? Some sounds are clearly more disturbing to animals than others in the same frequency band.
 - Significant gaps exist in the base of research on marine mammal hearing, auditory threshold levels, biologically significant disturbance, and noise levels from various sources. Development of noise criteria should be postponed until these gaps are filled.
 - One size does not fit all for sound sources. The grouping of species and the categorization of anthropogenic sound are good. Although this creates a rather complicated “matrix” of possible exposure thresholds, a subset would be needed for any particular action.
 - Suggestions for improving the substance of the criteria under consideration include (a) accounting for all behavioral and physical impacts, not just auditory ones; (b) accounting for indirect and longer-term effects; (c) making, wherever possible, more fine distinctions between marine mammal species (whereas all whales are now grouped into two categories); (d) treating more conservatively all noise-producing activities with potential impacts on resources of marine protected areas, such as the National Marine Sanctuaries; (e) treating more conservatively noise that may impact particularly sensitive receptors (such as mother-calf pairs or migrating whales); and (f) addressing cumulative and synergistic impacts.
 - Geography needs to be considered as the risk of driving cetaceans ashore is greater in near-shore waters than in the open ocean. The potential for diving diseases like the bends is higher in deep water than in shallow water. The risk of vessel collision during a period of threshold shift may increase more in a shipping lane than in a remote area. The risk of predation due to behavioral changes or threshold shifts is probably higher where predator density is higher.
 - What are the methods used to account for the constantly changing and regional differences of the ocean environment and its effect on noise characteristics?

Support of Lowering Noise Levels

- NMFS should lower the allowable levels of ocean noise that affect marine mammals.

Data Gaps

- NMFS acknowledges the data gaps through some of the assumptions it will need to make during the development of its acoustic matrix of threshold levels, including:
 - All species in a functional hearing group have the same threshold;
 - The relatively limited set of data is capable of covering cases of missing data, so that information about the auditory of sensibilities of dolphins will apply to “other cetaceans;”
 - Applying hearing data from mid-frequency mammals to low-and high-frequency mammals is appropriate;
 - Utilizing data from terrestrial mammals is appropriate;
-

- Extrapolating permanent threshold shift (PTS) levels from a limited set of temporary threshold shift (TTS) data, since no data on PTS exist, is appropriate; and
- Behavioral avoidance constitutes a biologically significant disturbance.
- This long list of assumptions that NMFS is apparently willing to make is troubling from both a scientific and a regulatory perspective.
- There is a lack of audiograms on marine mammals available to regulators and other policymakers.

Indirect, Long-term, and Cumulative Effects

- The cumulative effect of effectively constant noise over very long periods must be addressed based on perceived reality, not the frequency of pulses per array over time.
- The EIS must consider indirect and longer-term effects for each proposed set of criteria evaluated-not simply the criteria's immediate, short-term impacts.
- The effects on the ecosystem seem to be ignored under these acoustic exposure criteria. The marine ecosystem is poorly understood and complex. Nevertheless, impacts from noise that affect ecological processes could well be occurring and must be considered, as these could indirectly affect marine mammals.
- Will there be an assessment of the long-term effects and non-hearing organ effects of anthropogenic noise on marine mammals and other marine creatures?

Mitigation

- At the moment there is very little effort focused on assessing the measures of mitigation that are currently imposed. Serious effort should be invested in monitoring the effectiveness of the management measures that are currently prescribed. This should be considered in context of the different species of cetaceans as well as varying surrounding environmental characteristics.

MMPA

- NMFS should address the specific issue of the Marine Mammal Protection Act's definition of harassment.
- The definitions of "take" vary under the ESA and MMPA. NMFS must clarify how the guidelines can equally satisfy the multiple definitions. In addition NMFS must address the definition of harass according to the ESA.

Scientific Advisory Committee

- NMFS should provide the names, affiliations and research funding support sources (including NMFS and the US Navy) for the scientific advisory committee, and how the committee will interact with NMFS to provide the noise criteria.
 - What is the relationship between the NMFS process and the current review of noise criteria being conducted by the Marine Mammal Commission Advisory Committee, and will the NMFS process incorporate recommendations from the MMC Advisory Committee?
-

- The ‘expert panel’ is not representative of all interests and the work that has been conducted on the Acoustic Criteria to date has been conducted behind closed doors.

Education

- In order for the program to be effective some form of outreach and education should be initiated to inform the public and effected parties about the importance of sound to marine mammals and how anthropogenic sounds affect them.

General

- Over the last year, strong cautionary statements about the threat that loud ocean noise poses to marine mammals have been issued by the European Parliament, the International Whaling Commission, the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area, the Spanish government in relation to the Canary Islands, and the World Conservation Union.
- NMFS should explain the Proposal’s impact on Coastal Zone Management Act Plans to regulate underwater noise levels from human sources. Some states, including California and Hawaii, have undertaken to regulate underwater noise. NMFS should consider and explain to the public how these new guidelines will impact existing state Coastal Zone Management Plans.
- The EIS should evaluate existing and potential technologies that could attenuate or otherwise mitigate underway noise sources, including noise from vessels and marine construction activities.
- The way that this EIS and the alternatives are presented is designed to prejudice the outcome, as does the grossly inappropriate influence of the Noise Group upon whose ‘science’ these choices are based.
- The EIS must fully consider the impacts of NOAA’s proposed actions on the human environment, which is impossible unless and until NOAA provides specific sound exposure levels for all classes of marine mammals in the five functional hearing groups.
- What data and expertise will NMFS call upon to develop the EIS?
- NMFS should develop some process that allows modification of the criteria to accommodate new data or studies that are generated after the criteria are final, but which warrant modification of the final criteria.

Other Case Studies

- NMFS should examine studies of mass whale strandings and consider these studies when developing the noise criteria.

Conclusion

NMFS has completed its formal public scoping process for the Acoustics Guidelines EIS. The agency will consider the comments received, individually and cumulatively, and will address those comments in the EIS, to the extent required. Scoping is an iterative process

and NFMS will continue to consider all relevant input received throughout the development of the EIS.

Appendix A

**Notice of Intent
(70 Fed. Reg. 1871, January 11, 2005)**

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public memorandum which is on file at the U.S. Department of Commerce, in the Central Records Unit, in room B-099. In addition, a complete version of the *Decision Memorandum* can be accessed directly on the Web at www.ia.ita.doc.gov.²

Sales Below Cost in the Home Market

As discussed in more detail in the *Preliminary Results*, the Department disregarded home market below-cost sales that failed the cost test in the final results of review.

Changes Since the Preliminary Results

A list of the issues which parties have raised and to which we have responded, all of which are in the *Decision Memorandum*, is attached to this notice as Appendix I. Based on our analysis of the comments received, we have made no changes in the margin calculation.

Final Results of the Review

We determine that the following percentage weighted-average margin exists for the period June 1, 2002, through May 31, 2003:

CERTAIN STAINLESS STEEL BUTT-WELD PIPE FITTINGS FROM TAIWAN

Producer/ manufacturer/exporter	Weighted-average margin (percent)
Ta Chen Stainless Pipe Co., Ltd	5.08

Assessment Rates

The Department will determine, and U.S. Customs and Border Protection ("CBP") shall assess, antidumping duties on all appropriate entries. In accordance with 19 CFR 351.212(b)(1), we have calculated an importer-specific assessment rate for merchandise subject to this review. The Department will issue appropriate assessment instructions directly to CBP within 15 days of publication of these final results of review. We will direct CBP to assess the resulting assessment rates against the entered customs values for the subject merchandise on each of the importer's entries during the review period. For duty assessment purposes, we calculated importer-specific assessment rates by dividing the dumping margins calculated for each importer by the total entered value of sales for each importer during the POR.

² The paper copy and electronic version of the public version of the *Decision Memorandum* are identical in content.

Cash Deposit Requirements

In accordance with section 751(a)(1) of the Act, the following deposit requirements will be effective upon publication of this notice of final results of administrative review for all shipments of certain stainless steel butt-weld pipe fittings from Taiwan entered, or withdrawn from warehouse, for consumption on or after the date of publication: (1) The cash deposit rate for Ta Chen will be the rate shown above; (2) for previously reviewed or investigated companies not listed above, the cash deposit rate will continue to be the company-specific rate published for the most recent period; (3) if the exporter is not a firm covered in this review, a prior review, or the original less-than-fair-value (LTFV) investigation, but the manufacturer is, the cash deposit rate will be the rate established for the most recent period for the manufacturer of the merchandise; and (4) the cash deposit rate for all other manufacturers shall continue to be 51.01 percent.

These deposit requirements shall remain in effect until publication of the final results of the next administrative review.

Notification of Interested Parties

This notice also serves as a final reminder to importers of their responsibility under 19 CFR 351.402(f)(2) to file a certificate regarding the reimbursement of antidumping duties prior to liquidation of the relevant entries during this review period. Failure to comply with this requirement could result in the Secretary's presumption that reimbursement of antidumping duties occurred and the subsequent assessment of doubled antidumping duties.

This notice also serves as the only reminder to parties subject to administrative protective orders ("APO") of their responsibility concerning the return or destruction of proprietary information disclosed under APO in accordance with 19 C.F.R. 351.305. Timely written notification of the return/destruction of APO materials or conversion to judicial protective order is hereby requested. Failure to comply with the regulations and terms of an APO is a violation which is subject to sanction.

We are issuing and publishing this determination and notice in accordance with sections 751(a)(1) and 777(i) of the Act.

Dated: January 3, 2005.

James J. Jochum,

Assistant Secretary for Import Administration.

Appendix I—List of Issues for Discussion

- Comment 1: Adverse Facts Available ("AFA") for the Emerdex Companies³
- Comment 2: Partial AFA for Dragon Stainless Inc. ("Dragon Stainless") Selling Expenses
- Comment 3: Whether To Apply Total AFA for Ta Chen
- Comment 4: Constructed Export Price ("CEP") Offset and Level of Trade ("LOT")
- Comment 5: CEP Profit
- Comment 6: Date of Sale for Home and U.S. Market Sales
- Comment 7: Overstated Home Market Packing Expenses
- Comment 8: Short-Term Borrowing
- Comment 9: Total AFA for Liang Feng and Tru-Flow

[FR Doc. E5-62 Filed 1-10-05; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

I.D. 060804F

Endangered Fish and Wildlife; Notice of Intent to Prepare an Environmental Impact Statement

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA).

ACTION: Notice of Public Scoping and Intent (NOI) to prepare an Environmental Impact Statement (EIS); request for written comments.

SUMMARY: NMFS will be preparing an EIS to analyze the potential impacts of applying new criteria in guidelines to determine what constitutes a "take" of a marine mammal under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) as a result of exposure to anthropogenic noise in the marine environment. This notice describes the proposed action and possible alternatives and also describes the proposed scoping process. **DATES:** NMFS will hold 4 public meetings to obtain comments on the scope of issues to be addressed in the EIS. The locations of the meetings are San Francisco, CA; Seattle, WA; Boston, MA; and Silver Spring, MD. See Supplementary Information for

³ The Department will address all the Emerdex companies within this comment: Emerdex Stainless Flat Roll Products ("Emerdex 1"), Emerdex Stainless Steel ("Emerdex 2"), Emerdex Group, Inc. ("Emerdex 3") and Emerdex Shutters ("Emerdex 4").

meetings dates and locations. In addition to obtaining comments in the public scoping meetings, NMFS will also accept written and electronic comments. Comments must be received by March 14, 2005.

ADDRESSES: Written comments on the scope of the EIS and requests to participate in the public scoping meetings should be submitted to P. Michael Payne, Chief, Marine Mammal Conservation Division, Office of Protected Resources, NMFS (F/PR2), 1315 East-West Highway, Silver Spring, MD 20910. Written comments may also be submitted by email to AcousticEIS.Comments@noaa.gov or by facsimile (fax) to (301) 427-2581. Include in the subject line the following identifier: I.D. 060804F.

FOR FURTHER INFORMATION CONTACT: Brandon Southall, Office of Protected Resources, NMFS, 1315 East-West Highway, Silver Spring, MD 20910; Telephone (301) 713-2322. Additional information is available at (www.nmfs.noaa.gov/prot_res/PR2/Acoustics_Program). For information regarding the EIS process, contact Michael Payne at the above referenced contact information.

SUPPLEMENTARY INFORMATION:

Meetings Dates and Locations

The San Francisco, CA scoping meeting: January 18, 2005, 5 p.m. - 8 p.m. The meeting location is Hilton Fisherman's Wharf, 2620 Jones Street, San Francisco, CA, 94133, telephone: 415-885-4700.

The Seattle, WA scoping meeting: January 20, 2005,

5p.m. - 8p.m. The meeting location is NOAA's Western Regional Center, Building 9 Auditorium, 7600 Sand Point Way NE, Seattle, WA, 98115.

The Boston, MA scoping meeting: January 25, 2005,

5p.m. - 8p.m. The meeting location is the New England Aquarium, Conference Center, Central Wharf, Boston, MA 02110.

The Silver Spring, MD scoping meeting: January 27, 2005, 5p.m. - 8p.m. The meeting location is the NOAA's Auditorium, 1301 East West Highway, Silver Spring, MD 20910.

Background

Section 3(18)(A) of the MMPA defines "harassment" as:

...any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing,

nursing, breeding, feeding, or sheltering [Level B harassment].

The National Defense Authorization Act, enacted in November 2003, altered the definition of marine mammal harassment for "military readiness activities" and "scientific research activities conducted by or on behalf of the Federal Government consistent with section 104 (c)(3)" of the MMPA, as follows:

(i) any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment];

(ii) any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered [Level B harassment].

NMFS has been using generic sound exposure thresholds since 1997 to determine when an activity in the ocean that produces sound might result in impacts to a marine mammal such that a take by harassment might occur (an 'acoustic' take). NMFS is developing new science-based thresholds to improve and replace the current generic exposure level thresholds that have been used since 1997.

Proposed Action

NMFS will be proposing to replace the current Level A and Level B harassment thresholds with guidelines based on exposure characteristics that are derived from empirical data and are tailored to particular species groups and sound types. These guidelines will identify exposures levels and durations that may produce either temporary or permanent shifts in hearing sensitivity thereby providing a more scientific basis for defining the threshold levels that might result in marine mammal harassment. Such information would be of use to industry (oil and gas, marine construction), researchers, academic, government, military and shipping activities.

As currently envisioned, the noise exposure guidelines would be based on the following sets of criteria. They would divide marine mammals into five functional hearing groups: low-frequency cetaceans (all mysticetes or baleen whales); mid-frequency cetaceans (all odontocete species (dolphins and porpoises) not included in the low or high frequency groups); high-frequency cetaceans (harbor and Dall's porpoise, river dolphins); pinnipeds under water (seals, fur seals and sea lions); and pinnipeds out of water. Each of the functional hearing

groups has somewhat different hearing capabilities. Consequently, frequency-specific thresholds are being developed based on what is known about these differences.

The criteria would also categorize all anthropogenic sounds into four different types: single pulses (brief sounds with a fast rise time); single non-pulses (all other sounds); multiple pulses in a series; and multiple non-pulses in a series. Each of the five functional hearing groups would then be paired against the four sound types resulting in a matrix of values. These values would represent the noise-exposure criteria that NMFS would use, at least in part, to guide determinations of when an anthropogenic sound results in an acoustic "take" by harassment under the MMPA or ESA for each of the different marine mammal hearing groups. All threshold values would be expressed in terms of either a sound pressure level value that the animal receives, or as a measure of exposure that incorporates both sound pressures and time as a dimension where it is appropriate. This is referred to as the sound exposure, or energy flux density level. Energy levels are not directly comparable to pressure levels because of the time dimension.

A number of assumptions will be made in developing the acoustic matrix of threshold levels. For example, in most cells within the matrix, the criteria assume that all species in a functional hearing group have the same threshold apply to all species in the group. In reality, some species are so different from others in their functional hearing group that separate threshold criteria are appropriate for them. Further, there are no direct data on the effects of many kinds of sounds on many species of marine mammals. For now, therefore, it is necessary to extrapolate making reasonably conservative criteria from existing data to cover cases of missing data. An example of an extrapolation is the use of data from dolphins or beluga whales for other cetaceans. Most data on the effects of noise on marine mammals come from mid-frequency dolphins, especially bottlenose dolphins and beluga whales. The results of studies on these species are applied directly to low- and high-frequency cetaceans (for which data are sparse or non-existent) without adjustment. This substitution is likely conservative for low frequency cetaceans because the mid-frequency cetacean ear is almost certainly more sensitive. The substitution is also likely satisfactory for high-frequency cetaceans. In the absence of data for marine mammals, in some cases, data from terrestrial mammals are used in determining exposure criteria.

Purpose of the Action

NMFS will prepare an EIS to assess the potential impacts of the proposed framework for developing and implementing science-based acoustic criteria. The EIS will analyze the potential environmental impacts resulting from implementation of the proposed noise exposure criteria to determine acoustic-based harassment of marine mammals, and alternative noise exposure criteria.

The areas of interest for evaluation of environmental and socioeconomic effects will be U.S. and international waters.

Use of the Noise Exposure Criteria

The noise exposure criteria would be used to inform NMFS guidelines as to what characteristics of human sound exposure (e.g., exposure frequency, level, and duration) might result in harassment and constitute a take under the MMPA and ESA. For example, an acoustic "take" might be considered to have occurred whenever the sound that the animal receives exceeds the exposures defined by the criteria. The noise exposure criteria would also provide guidance with respect to what type of take might result from exposure to sound - one for Level A harassment and one for Level B harassment.

Scope of the Action

The scope of the EIS will identify and evaluate all relevant impacts, conditions, and issues associated with the proposed framework for the development and implementation of these criteria, and alternatives, in accordance with Council on Environmental Quality's (CEQ) Regulations at 40 CFR parts 1500 - 1508, and NOAA's procedures for implementing NEPA found in NOAA Administrative Order (NAO) 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act, dated May 20, 1999.

The EIS will analyze the potential environmental impacts of implementation of the proposed framework and noise exposure criteria to determine acoustic "takes" of marine mammals, and alternative frameworks for developing and implementing noise exposure criteria. The EIS must meet the requirements of NEPA and the analyses must also document compliance with the related environmental impact analysis requirements of other statutes and executive orders. These include, but are not limited to, the MMPA, Coastal Zone Management Act, ESA, and the Magnuson-Stevens Fishery Conservation and Management Act.

Alternatives

The EIS will consider several alternatives for determining the acoustic threshold at which both Level A and Level B harassment takes might occur: 1) maintaining the status quo (the no action alternative); 2) using a precautionary approach and very conservative interpretations of data on marine mammals based on considering human noise exposures relative to ambient noise conditions; 3) defining a Level A harassment take as that exposure which results in a temporary shift in hearing sensitivity (TTS) and a Level B harassment take as that exposure estimated to result in a 50 percent behavioral avoidance for each species or group of species; 4) defining Level A harassment take as that exposure which results in a Permanent Threshold Shift (PTS) minus 6 decibels (dB) and defining a Level B harassment take as a level 6 dB below that exposure estimated to causes TTS; 5) defining a Level A harassment take as noise exposure consistent with estimated PTS onset and a level B harassment take as TTS onset; and 6) defining a Level A harassment take as occurring at the PTS onset plus 6 dB and level B harassment take as 6 dB below the estimated point of PTS onset (see Table 1).

TABLE 1: ACOUSTIC CRITERION FOR EACH OF THE PROPOSED ALTERNATIVES

Alternative	Level A Criterion	Level B Criterion
I (Status Quo)	180 dB _{rms} re: 1µPa	160 dB _{rms} re: 1µPa (impulse) 120 dB _{rms} re: 1µPa (continuous).
II	Highest average	lowest possible natural ambient.
III	TTS Onset	50% Behavioral Avoidance.
IV	PTS Onset-6dB	TTS Onset-6dB.
V	PTS Onset	TTS Onset.
VI	PTS Onset+6dB	PTS Onset-6dB.

Alternative I: A no action alternative would perpetuate the use of the existing thresholds for Level A harassment (sound pressure level of 180 dB_{rms} re: 1µPa) (hereafter dB SPL), and Level B harassment (160 dB SPL for impulse noise and 120 dB SPL for continuous sound) that have been used for the past six years. The advantages of this alternative are that the public is familiar with this approach, and safety zones can easily be calculated from standard sound propagation models. A disadvantage is that this considers only the sound pressure level of an exposure but not its other attributes, such as duration, frequency, or repetition rate, all of which are critical for assessing impacts on marine mammals. For example, a sound of 181 dB SPL lasting

for two seconds would be identified as a Level A harassment take, but a potentially more harmful sound of 179 dB SPL lasting two days is currently considered a Level B harassment take. It also assumes a consistent relationship between rms (root-mean-square) and peak pressure values for impulse sounds, which is known to be inaccurate under certain (many) conditions.

Alternative II: A second alternative is based on very conservative behavioral response data for marine mammals. Under this alternative takes would occur at the SPL at which the most sensitive species first begin to show a behavioral response. Level A harassment would occur if the received noise from a human source exceeded

the highest average ambient noise level in the area of operation. Level B harassment would occur if the received noise from a human source exceeded the lowest possible ambient noise condition. Criteria based largely on behavioral responses to noise just above ambient level would be extremely conservative. Under this alternative, a behavioral response may, and behavioral avoidance would, constitute Level B harassment.

Alternative III: A third alternative would define a Level A harassment take as occurring at that level of exposure which results in a temporary loss of hearing sensitivity (TTS) but which is fully recoverable. This approach is also conservative because scientific experts in this field do not consider TTS to

result in harm or injury because no irreversible cell damage is involved. A Level B harassment take would be defined as that level of noise exposure known or estimated to result in 50 percent behavioral avoidance of a sound source for each species or animal group. There are a small number of these types of empirical data available for certain conditions, but some of the level B criteria constructed in this manner would require extrapolations and assumptions, particularly in the above context of how biological significance is defined. Generally this alternative would be less conservative than the previous alternative.

Alternative IV: A fourth alternative would determine that a Level A harassment take occurs at that level of noise exposure which results in a permanent loss of hearing sensitivity (PTS) due to non-recoverable cell damage, minus some "safety" factor. This alternative would be more conservative than federal workplace standards for humans which permit exposures that result in some degree of PTS over a lifetime for some individuals. A doubling of absolute sound pressure magnitude (in μPa) represents a 6 dB increase in SPL. A proposed "safety" factor to ensure that exposures do not result in permanent

injury is to set the Level A harassment criteria 6 dB below that noise exposure estimated to cause PTS onset for each animal group. The proposed Level B harassment take criteria for alternative 4 are those exposures resulting in TTS onset minus a "safety" factor of 6 dB.

Alternative V: A fifth alternative defines a Level A harassment take as noise exposures estimated to result in PTS onset and Level B harassment take as noise exposures consistent with TTS onset for each animal group. This alternative would allow Level A harassment criteria levels that are higher than either TTS (Alternative III) or PTS minus some safety factor (Alternative IV); Level A harassment criteria would be based on those exposures that are believed to result in irreversible tissue damage. The Level B harassment criteria under Alternative V would set the take threshold slightly higher than Alternative IV but considerably below those in Alternative 6.

Alternative VI: A sixth alternative defines a Level A harassment take based on estimated PTS onset (as in Alternatives 4 and 5), but requires a higher probability of exposed animals experiencing a meaningful change in hearing sensitivity above merely the onset of tissue injury, such as 6 dB of PTS. Under Alternative VI, Level B

harassment take would be defined as exposures estimated as 6 dB below those required to cause PTS onset. This alternative would result in noise threshold levels that are greater than any of the other proposed alternatives.

The noise exposure criteria are based on research available for all species of marine mammals, plus some data from terrestrial mammals and humans. Using data from one species of mammals to set criteria for another species is acceptable for injury because the anatomy of the inner ear of all mammals is extremely similar. As an example, certain human hearing standards are based in part on extrapolations from the effects of noise on the chinchilla ear. Table 2 provides an example of noise exposure criteria that would result under each of the proposed alternatives for gray whales. Gray whales were selected as an example because some data on behavioral reactions exist and are used (in Alternative III), but setting criteria based on TTS or PTS rely on extrapolations from other cetacean species (Alternatives III-VI). The use of direct information combined with reasonable extrapolation is representative of how such criteria would be established under any of the alternatives.

TABLE 2: EXAMPLE OF NOISE EXPOSURE CRITERIA FOR GRAY WHALES FOR EACH OF THE PROPOSED ALTERNATIVES

Alternative	Level A Criterion	Level B Criterion
I	180 dB _{rms} re: 1 μPa	160 dB _{rms} re: 1 μPa (impulse) 120 dB _{rms} re: 1 μPa (continuous).
II	Both criteria variable	depending on environment.
III	195 dB re: 1 $\mu\text{Pa}^2(\text{s})$	160 dB _{rms} re: 1 μPa .
IV	209 dB re: 1 $\mu\text{Pa}^2(\text{s})$	189 dB re: 1 $\mu\text{Pa}^2(\text{s})$.
V	215 dB re: 1 $\mu\text{Pa}^2(\text{s})$	195 dB re: 1 $\mu\text{Pa}^2(\text{s})$.
VI	221 dB re: 1 $\mu\text{Pa}^2(\text{s})$	209 dB re: 1 $\mu\text{Pa}^2(\text{s})$.

Alternative I indicates the status quo criteria already in place. Alternative II criteria are established based on ambient noise conditions experienced by animals in the area of operation. Since these conditions may be dominated by either natural or human noise and are quite variable depending on many spatial and temporal factors, the criteria for determining both Level A and Level B harassment are variable depending on the operational environment. In Alternative III, the Level A criterion is set at noise exposures estimated to cause TTS [195 dB re: 1 $\mu\text{Pa}^2(\text{s})$]. This is the estimated point of TTS onset for cetaceans based on Finneran et al. (2002)]. For Alternative III, Level B criteria are based on behavioral avoidance data for migrating

gray whales (Malme *et al.*, 1983; 1984). These are, in fact, the same data upon which the status quo (Alternative I) Level B data are based.

An additional extrapolation is made in Alternative IV to estimate PTS. The level of noise exposure required to induce PTS in marine mammals is unknown, but may be estimated using the TTS onset data and extrapolations based on terrestrial mammals. Using the slope of the function relating increases in noise exposure and TTS, and using a relatively conservative estimate of PTS as 40 dB of TTS, it is estimated that an additional 20 dB of noise exposure is required above TTS onset to induce PTS. Thus, for Alternative IV, the Level A harassment criterion is estimated TTS onset (195 dB re: 1 $\mu\text{Pa}^2(\text{s})$) plus 20 dB

to equal PTS onset (215 dB re: 1 $\mu\text{Pa}^2(\text{s})$) minus 6 dB, or 209 dB re: 1 $\mu\text{Pa}^2(\text{s})$. The Level B harassment criterion for Alternative IV is estimated TTS onset (195 dB re: 1 $\mu\text{Pa}^2(\text{s})$) minus 6 dB, or 189 dB re: 1 $\mu\text{Pa}^2(\text{s})$.

For Alternative V, the Level A harassment criterion is the estimated PTS onset (215 dB re: 1 $\mu\text{Pa}^2(\text{s})$ as described above) and the Level B harassment criterion is estimated TTS onset (195 dB re: 1 $\mu\text{Pa}^2(\text{s})$). In Alternative VI, the Level A harassment criterion is 6 dB above estimated PTS onset (or 221 dB re: 1 $\mu\text{Pa}^2(\text{s})$) while the Level B harassment criterion is 6 dB below estimated PTS onset (or, 209 dB re: 1 $\mu\text{Pa}^2(\text{s})$).

Public Involvement and the Scoping Process

NMFS' intent is to afford an opportunity for the public, including interested citizens and environmental organizations; any affected low-income or minority populations; affected local, state and Federal agencies; and any other agencies with jurisdiction or special expertise concerning the environmental impacts to be addressed in the EIS to participate in this process.

NMFS will hold public scoping meetings and accept oral and written comments (See **ADDRESSES**) to determine the issues of concern with respect to practical considerations involved in applying these criteria and to determine whether NMFS is addressing the appropriate range of alternatives. In addition to comments on other aspects of the scope of this EIS, NMFS is particularly interested in comments regarding real-world application of the science-based noise exposure criteria. The public, as well as Federal, state, and local agencies, are encouraged to participate in this scoping process. The dates and locations of these meetings appear in this **Federal Register** notice (See **SUPPLEMENTARY INFORMATION**).

NMFS is also seeking written comments on the scope of issues that should be addressed in the EIS. The agency also invites the public to submit data, new information, and comments by e-mail, mail, or fax (See **ADDRESSES**) identifying relevant environmental and socioeconomic issues to be addressed in the environmental analysis.

Dated: January 6, 2005.

P. Michael Payne,

Acting Director, Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. 05-525 Filed 1-6-05; 3:17 pm]

BILLING CODE 3510-22-S

DEPARTMENT OF COMMERCE**National Oceanic and Atmospheric Administration**

[I.D. 010605B]

North Pacific Fishery Management Council; Notice of Public Meetings

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Meetings of the North Pacific Fishery Management Council and its advisory committees.

SUMMARY: The North Pacific Fishery Management Council (Council) and its advisory committees will hold public

meetings February 7 through February 15, 2005 at the Renaissance Madison Hotel, 515 Madison Street, Seattle, Washington.

DATES: The Council's Advisory Panel will begin at 8 a.m., Monday, February 7 and continue through Friday February 11, 2005. The Scientific and Statistical Committee will begin at 8 a.m. on Monday, February 7, 2005, and continue through Wednesday, February 9, 2005.

The Council will begin its plenary session at 8 a.m. on Wednesday, February 9 and continuing through Tuesday February 15. All meetings are open to the public except executive sessions. The Enforcement Committee will meet Tuesday, February 8 from 1 pm to 5 pm. The Ecosystem Committee will meet Monday, February 7, from 1 pm to 5 pm.

ADDRESSES: Renaissance Madison Hotel, 515 Madison Street, Seattle, Washington.

Council address: North Pacific Fishery Management Council, 605 W. 4th Avenue, Suite 306, Anchorage, AK 99501-2252.

FOR FURTHER INFORMATION CONTACT: Council staff; Phone: 907-271-2809.

SUPPLEMENTARY INFORMATION:**Council Plenary Session**

The agenda for the Council's plenary session will include the following issues. The Council may take appropriate action on any of the issues identified.

Reports

Executive Director's Report
National Marine Fisheries Service Management Report
Enforcement Report
Coast Guard Report
Alaska Department of Fish & Game Report (and review of proposals to Board of Fisheries)

U.S. Fish & Wildlife Service Report
Protected Species Report (Review MMPA listing proposed rule)

Essential Fish Habitat (EFH) and Habitat Area Particular Concern (HAPC)

Review changes to EFH Environmental Impact Statement (EIS). Final action on EFH Preferred Alternative. Final action on HAPC alternatives and Environmental Assessment/Regulatory Impact Statement/Initial Regulatory Flexibility Analysis.

Gulf of Alaska Groundfish (GOA) Rationalization

Receive report from Community Committee and action as necessary. Review crab/salmon bycatch data and refine alternatives.

GOA Rockfish Demonstration Project

Review available information and refine alternatives as appropriate.

Improved Retention/Improved Utilization (IR/IU)

Review progress on Amendment 80 analysis and legal issues, and provide direction as necessary.

American Fisheries Act

Review 2004 cooperative (co-op) reports and 2005 co-op agreements.

Bering Sea and Aleutian Island (BSAI) Bycatch

Review action plan and refine alternatives.

Groundfish Management

Non-Target Species Committee report. Review rockfish management preliminary discussion paper. GOA and BSAI Other Species breakout: Review action plan. AI Special Management Area: Review discussion paper. GOA pollock trip limits: Review discussion paper. Review EFP for Seabird avoidance measures. (T)

Staff Tasking

Review Seldovia Village request for Amendment 66 eligibility. Review tasking and Committee and initiate action as appropriate.

Other Business

Scientific and Statistical Committee (SSC)

The SSC agenda will include the following issues:

1. EFH and Center for Independent Experts
2. Groundfish Management
3. Special Session on Modeling Workshop

Advisory Panel

The Advisory Panel will address the same agenda issues as the Council.

Special Accommodations

These meetings are physically accessible to people with disabilities. Requests for sign language interpretation or other auxiliary aids should be directed to Gail Bendixen at 907-271-2809 at least 7 working days prior to the meeting date.

Dated: January 6, 2005.

Alan D. Risenhoover,

Acting Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

[FR Doc. E5-57 Filed 1-10-05; 8:45 am]

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Appendix B
Scoping Meeting Notes

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NMFS Acoustic Guidelines for Marine Mammal Protection
Public Scoping Meeting, January 18, 2005; 5:00pm – 7:00pm
Hilton Fisherman's Wharf, San Francisco
Meeting Summary Notes

The meeting started at 5:07pm and was attended by 19 persons. Ms. Patricia Lawson and Dr. Brandon Southall of NMFS along with Kirby Gilbert of Battelle led the meeting. Ms. Lawson, Mr. Gilbert, and Dr. Southall each gave a brief presentation using a total of 16 PowerPoint slides projected onto a screen at the front of the room. The presentation covered basic information on background, context, need, and use of acoustic guidelines along with brief overview of the NEPA process and a more detailed presentation on the development and intent of the new guidelines and possible alternatives. This lasted approximately one hour with some discussion and questions at the end of Dr. Southall's presentation. The following questions, issues, and comments were presented by the attendees in the audience.

General Audience Comments, Issues, and Questions:

Will the public comments verbally presented at the scoping meetings to be recorded and transcribed?

- Response: Comments were being noted by note takers. Meetings are being recorded.

Are other marine biotas besides marine mammals being considered in the development of new acoustic guidelines?

- Response: A second science panel is just starting work on fish and turtles and sound but the work is not far along yet.

Where is the NMFS Acoustics Expert Panel ("Science Panel") at with respect to their process in development of new acoustic criteria?

- Response: Panel has come up with the basic criteria presented at this meeting. They are getting a manuscript ready for publication in mid-2005.

Will Science Panel's recommendation be an alternative in the EIS?

- The Science Panel's work has helped to create the range of alternatives presented so far.

Do the new proposed acoustic guidelines take into account what a marine mammal is doing at time of exposure; i.e. breeding, migrating?

- Response: some of the guidelines do consider these aspects of behavior and associated sensitivities.

How do the guidelines extrapolate for Gray Whales?

- Response: using mid-frequency odontocetes.

Are any of the assumptions used in developing the guidelines based on pressure gradients?

- Response: Guidelines are being based on sound exposure levels.

How do the guidelines extrapolate for Sperm Whales?

- Response: data on TTS is extrapolated from bottlenose dolphins (mid-frequency cetaceans)

Is Level B criteria in the matrix defined by Level A?

- Response: No, in last three alternatives it is defined by TTS and PTS.

Can stranded Mysticetes be used in testing for acoustic thresholds?

- Response: Generally no as their condition is too bad to do accurate testing.

Suggestion that NMFS consider that marine mammals may be affected by acoustics beyond hearing and sound transmission through the cochlea, many marine mammals may have other conduction systems to transmit acoustic sounds from the neural system to the cranial systems,

Why does NMFS have two sets of criteria (i.e. Level A and Level B)?

- Response: Mostly due to the definitions in the MMPA.

Suggestion to list and describe promising research that is underway while the EIS is being prepared,

Suggestion that other physical disturbance factors such as underwater explosions be considered in the deriving new guidelines,

Will the new guidelines be mandatory limits?

- Response: as guidelines NMFS permits division will implement and they should be as mandatory as guidelines are today.

Will the Data Quality Law be used in development of the new guidelines?

- Response: all of the science panel work is based on science and scientific information available for public disclosure.

Public Speaker Comments

Cara Horwitz, NRDC –

- Pleased NMFS is developing new science based standards;
- Feels Alternatives 4, 5 and 6 (from PowerPoint presentation and NOI) would be illegal to adopt partly because no behavior data is being used for those guidelines. Highly opposed to Alternatives 4, 5 and 6 and recommends dropping them from further consideration;

- Recommends focusing on Alternatives 2 & 3 in the EIS; and
- Are Federal Advisory Committee Act (FACA) guidelines and processes being used by the Science Panel?

Michael Stocker, SEAFLOW –

- Other sea life and animals should be considered when establishing harassment levels;
- Management decisions should be made on an ecosystem basis, not by selected species;
- Using energy-flux density is important when considering sound effects as it incorporates time, direction and proximity;
- It is now thought that fish can detect marked differences between particle motion verses pressure gradients; and
- Invertebrates and other marine life should be considered or the guidelines will be very shortsighted.

Jerry Wilson, Fugro Pelagos –

- NMFS needs to consider how its new guidelines might affect routine navigation safety work and other routine beneficial work such as bathymetric surveys or fisheries or habitat investigations; and
- NMFS needs to consider if new guidelines are going to cause delays or increase costs borne by agencies, industries or educational institutions productive work in things like routine hydrographic surveys (“acoustically productive activities”)

Mark Palmer, Earth Island Institute –

- Recommend an alternative that limits acceptable noise levels to simple 120db or below for pulses and 100db or below for continuous, non-pulse noise sources;
- Does not believe the new guidelines will be based on science;
- Concerned over the short notice from the publication of the NOI (Jan. 11th) and this public meeting (Jan. 18th);
- Would like for NMFS to disclose the funding sources for each of the Science Panel members in the EIS;
- Would like to see the EIS describe the relationship between the MMC and NOAA in developing these guidelines;
- Would like to know what is the preferred alternative by NMFS at this time;
- Would like to see a list of species that are being extrapolated for, verses information being used from species that have been actually tested;
- Would like the guidelines to be based on a wide range of species from fin fish to shrimp as they may be more sensitive than marine mammals;

- Recommends using a more uniform set of standards in the guidelines because enforcement would be more straightforward and better achieved;
- Concerned that exposure levels are being based upon temporary threshold shifts and this approach may not get at low levels of sound that could cause stranding; and
- Concerned the new guidelines might not take into account rectified diffusion or gas bubble disease at low levels. Mentioned that for humans the standard for noise in the marine environment is no more than 145db.

The meeting concluded at 7:10pm.

NMFS Acoustic Guidelines for Marine Mammal Protection
Public Scoping Meeting, January 20, 2005; 5:00pm – 7:00pm
NOAA's Western Regional Center, Seattle
Meeting Summary Notes

The meeting started at 5:03pm and was attended by 39 persons. Ms. Patricia Lawson and Dr. Roger Gentry of NMFS along with Kirby Gilbert of Battelle led the meeting. Ms. Lawson, Mr. Gilbert, and Dr. Gentry each gave a brief presentation using a total of 14 PowerPoint slides projected onto a screen at the front of the room. The presentation covered basic information on background, context, need, and use of acoustic guidelines along with brief overview of the NEPA process and a more detailed presentation on the development and intent of the new guidelines and possible alternatives. This lasted approximately one hour with some discussion and questions at the end of Dr. Gentry's presentation. The following questions, issues, and comments were presented by the attendees in the audience.

General Audience Comments, Issues, and Questions:

How does NMFS define received levels for a given animal in the ocean?

- Response: models are being used to determine noise propagation to estimate received levels at the individual mammal (ref. Acoustic Integration Model).

How will the new guidelines be applied; what would the mechanism be to apply these new guidelines to U.S. activities?

- Response: Guidelines would apply to U.S. Citizen's activities within International and U.S. waters. Guidelines hopefully will be set up online and one could possibly be able to go online to determine how the guidelines will work.

Need criteria for entire socks, whole ecosystem effects need to be considered.

- Response: work on an ecosystem approach is underway, for now the idea is to use better science on marine mammals to improve the guidelines and update the guidelines later as more information becomes available.

Can you mix and match Level A and Level B criteria between alternatives?

- Response: Yes, the Level A and Level B criteria in the table of alternatives could be mixed and match to create a new alternative.

Science panel should consider marine mammals' frequent attraction to sound;

- Response: Science panel is considered how increased sound pressure would affect marine mammals and was asked to look at sound levels that lead to adverse effects.

Public Speaker Comments

Dr. David Bain, U. of Washington -

- How is ambient noise to be measured under Alternative II? An average ambient noise? What might be the means for establishing ambient noise? Cracking ice could skew the ambient average to a high level, not allowing a truly conservative threshold.
- Are Level B criteria being established from the Level A criteria?
- Does not feel that any of the criteria match what is meant by Level A and Level B under MMPA. If Alternative III, Level B criteria is based on 50 percent behavioral avoidance, what about the other 49 percent, would they not be suited for a Take permit?
- Favors the idea of grouping like animals, would like the details of the grouping expanded from what was in the NOI;
- Even though many species can be group in similar classes from a hearing standpoint, but species within a group can behave markedly different. Harbor and Dall's porpoises respond very different to how they tolerate noise. California and Stellar Sea Lions also are different in behavior and tolerance, so it is not just about hearing sensitivity.
- Injury from noise seems to only be defined here by hearing damage, but marine mammals maybe harmed by other indirect effects of noise, like Beak dolphins that might hide out at the bottom but then have to rise quickly for air and get the bends as a result of a noise event. The mechanics of death may have nothing to do with the actual sound, rather an indirect effect of sound. Foraging efficiencies and food intake could be compromised as a behavioral change from sound propagation, not measured by noise criteria alone.
- Would like to see criteria take into account indirect effects in addition to direct effects. What will the noise levels do to certain species "personalities" instead of just effects on physiology?

Donna Sandstrom, Orca Alliance-

- What is driving the need for new criteria on a fast track and what is wrong with the existing criteria?
- Feels any temporal (threshold shift) loss is unacceptable;
- Feels alternative II is the best but who would measure the ambient noise to set the criteria in a local environment?
- Feels the criteria are much too dependent upon visual observations at the time of a test, and there could be lingering effects or effects on marine mammals one cannot see in studies; and
- What is the definition of TTS?

Bob Wood, Global Research & Rescue –

- Is it possible that toxins in the marine environment could affect noise or how animals respond to noise; and
- How will NMFS enforce the new guidelines, how will NMFS measure the noise animals actually receive as a result of their permitted actions?

Ted Turk, SAIC –

- Is sonar considered an impulse or continuous sound source?; and
- Does NMFS use higher criteria sometimes in permit analysis?

Scott Sloughter, Center for Regulatory Effectiveness –

- Would like to know the relationship between the Science Panel criteria and policy guidelines

Joel Olson, Cetacean Research Technology and American Cetacean Society

- Are the criteria being developed using numbers/criteria from the human noise study protocols?

Birgit Krietz, Orca Relief –

- Has a serious problem with Alternative VI,
- Present standards are not adequate because 105db can cause significant changes in behavior;
- Believes Alternative II is closer to meeting the legal definitions under MMPA; and
- Effect on prey need to be considered or effects on predation.

The meeting concluded at 6:35pm.

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NMFS Acoustic Guidelines for Marine Mammal Protection
Public Scoping Meeting, January 25, 2005; 5:00pm – 7:00pm
New England Aquarium Education Center, Boston, Massachusetts
Meeting Summary Notes

The meeting started at approximately 5:15 pm with 6 people attending. Mr. Michael Payne from NMFS made brief introductions of the project team then gave a presentation. The presentation covered basic information on the project background, context, and need. He explained the use of acoustic guidelines, gave a brief overview of the NEPA process, and presented additional detail on the development and intent of the new guidelines and possible alternatives. The presentation lasted approximately one hour with some discussion and questions at the end of the presentation. No formal comments were presented; attendees were encouraged to submit written comments.

The following questions, issues, and comments were presented by the attendees in the audience.

General Audience Comments, Issues, and Questions:

Bill Rossiter, Cetacean Society International: Where did the 195db come from for the TTS level in gray whale? Mr. Rossiter is unfamiliar with any studies conducted on gray whales, thus if they have done any empirical TTS work on gray whales, he would appreciate receiving information on this or the data. What is an example of a repetitive pulse? Can he get the data from experiments performed in support of these guidelines?

- Response: Mr. Payne was unfamiliar with the exact details; therefore, he will ask Mr. Southold to get in touch with Mr. Rossiter to answer his questions.

In past acoustic EISs, when comments have been typed out and reported, they have been lumped together for categorical response. In several cases, reviewers who were not familiar with the subject have inaccurately grouped comments. Mr. Rossiter stated that he has seen a tendency to lump together comments that are more expert in nature with others that are more hype. If it is at all possible, he would appreciate NMFS taking a more sophisticated look at the grouping of the comments, so the important comments are not lost as they were in other EISs such as the Navy's.

- NMFS acknowledged the comment.

Has the Navy made any suggestions as to what they are looking for?

- Response: NMFS is presently trying to work with the Navy on this issue.

Deb Hadden, Massachusetts Port Authority: Ms. Hadden was not sure which alternatives would have an impact on the shipping industry. She asked if anything on a website would indicate the noise level a specific type of ship makes. Also,

whether there is any documentation on what types of activities would be affected by each alternative?

- Response: NMFS can assist in getting information on levels of noise produced by various ships because most were measured for sound already.
- Because it is not just the noise level being considered but also the duration and intensity, documents do not exist at this time stating which items will be effected by which alternatives. The EIS being developed will include an analysis of the affects of the alternatives on different industries along with examples.

Would each vessel be individually permitted based on their different travel patterns and possible interacts with different species?

- Response: At this time decisions have not been made on how the permitting will work, but Mr. Payne could foresee the possibility that different categories of sound producing units would be grouped such that every individual item did not need a permit.

The meeting concluded at 6:15 pm. NMFS staff remained available to answer questions on an individual basis until 7:00 pm when all public had left.

NMFS Acoustic Guidelines for Marine Mammal Protection
Public Scoping Meeting, January 27, 2005; 5:00pm – 6:30pm
NOAA Auditorium, Silver Spring, Maryland
Meeting Summary Notes

The meeting started at approximately 5:15pm and 47 people signed in. Mr. Michael Payne led the meeting. Mr. Payne covered basic information on background, context, need, and use of acoustic guidelines along with brief overview of the NEPA process; Dr. Brandon Southall gave a more detailed presentation on the development and intent of the new guidelines and possible alternatives. Dr. Roger Gentry and Mr. Steve Leathery also provided some clarification. This lasted approximately one hour with some discussion and questions at the end of Dr. Southall's presentation. No formal comments were presented; a few attendees indicated that they would be submitting written comments.

The following questions, issues, and comments were presented by the attendees in the audience.

General Audience Comments, Issues, and Questions:

- *Scott Slaughter, Center for Regulatory Effectiveness*: Did you say that the acoustic “take” criteria may or may not be applied in a regulatory context? How would the new acoustic guidelines be applied in a permit situation? Would a permittee be able to ignore the guidelines?
 - Response: NMFS is developing science-based criteria that may be applied through regulation or through guidelines. The guidelines would provide flexibility in the face of uncertainty (species present, distance from noise, densities, relation to sound).
- *Naomi Rose, The Humane Society of the United States*: The science panel convened to develop the criteria was not constituted pursuant to the Federal Advisory Committee Act (FACA) and its meetings were not open to the public.
 - Response: As a science panel, it was exempt from FACA requirements. The panel gathered information from scientists in acoustics fields on effects on marine mammals. The panel was not asked for advice and is not making policy or management decisions and has developed the criteria for only one of the alternatives being considered in the EIS. The EIS process is open to the public. The Marine Mammal Commission's advisory committee is also a FACA committee and its meetings are open to the public.
- *Unidentified*: Pulse vs. non-pulse is not in the matrix.
 - Response: This information is on the Marine Mammal Commission website (<http://www.mmc.gov/sound/plenary2/pdf/gentryetal.pdf>) (second plenary session of the Marine Mammal Commission advisory committee, April 29, 2004).
- *Susan Levitt, PSGS (Perot Systems Government Services)*: How is NMFS' process for considering new acoustic guidelines being coordinated with the

Marine Mammal Commission's advisory panel? How will these criteria be applied internationally?

- Response: The two processes are purposely being kept separate, although NMFS will use recommendations from the advisory committee in its decision making. The science panel and NMFS are looking at criteria for determining an acoustic "take;" the advisory committee is looking at the effect of sound on marine mammals. International work will take the criteria into account but will not be bound by it.
- *Tom Peeling, Turner Collie & Braden*: Is other marine life (e.g. turtles) being studied?
 - Response: The EIS is looking only at acoustic "takes" of marine mammals.

The meeting concluded at 6:15pm. NMFS staff remained available to answer questions on an individual basis.

Appendix C

Written Scoping Comments

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From :
 Date: Monday, January 10, 2005 10:06 am
 To: <Patricia.Lawson@noaa.gov>, <AcousticEIS.Comments@noaa.gov>
 Subject: Scoping meetings: marine mammal acoustics

From :
 Date: Saturday, January 15, 2005 3:10 pm
 To: AcousticEIS.Comments@noaa.gov
 Subject: ID: 060804F
 Dear Sir;

Patricia:
 Given increased military testing and minerals management activity in the Gulf of Mexico, can you tell me why NOAA didn't schedule a scoping meeting on this coast? Thanks,
 Mark Holan
 Staff Writer
 The Tampa Tribune

The purpose of this email is to support *lowering* the allowable levels of ocean noise that affect marine mammals.
 Sincerely,
 Donna Berriman

From: Dinda Evans
 Date: Monday, January 17, 2005 2:08 am
 To: AcousticEIS.Comments@noaa.gov
 Subject: NMFS: I.D. 060804F

Dinda Evans

The National Marine Fisheries Service (NMFS) has a duty under the Marine Mammal Protection Act to regulate those who emit noise into the ocean. This includes the military, with their use of ordnance and sonar; the oil and gas industry with their seismic explorations; and research scientists who use seismic energy to study the oceans. The current maximum noise level that NMFS use in their authorizations is 180db SPL.

Do you Yahoo!?
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The Issues:

NMFS is looking to revise the noise level criteria, upwards. Key arguments against this move include:

- 1 Since 1997 when NMFS started using 180 dB SPL, the following strandings coincide with the use of sonar or seismic airguns: the U.S. Virgin Islands (1998, 1999), the Bahamas (2000), Madeira (2000), the Canary Islands (2002 and 2004), Baja California (2002), and the NW coast of the United States (2003);
 - 2 The US Navy guidance for human divers exposed to noise is a level of 145 dB SPL;
 - 3 According to the US Navy in their investigation into the Bahamas stranding event, the level that the whales reacted to and died was 138 dB SPL;
 - 4 Most of the scientists that are advising NMFS are navy scientist, navy contractors, or have received funding at some time from the Office of Naval Research;
 - 5 The approach used to determine the new criteria disregards the long term effects of noise, does not account for noise damage to non-hearing organs, and does not take into account recent findings that suggest that certain whales get the 'bends' and die as a result of rising too quickly in response to noise levels just over background;
- Over the last year, strong cautionary statements about the threat that loud ocean noise poses to marine mammals have been issued by: the European Parliament; the International Whaling Commission; the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS); the Spanish government in relation to the Canary Islands; and the World Conservation Union. The marine mammals of the world need your help to protect them from this deadly threat.

I want to show that I support support for lowering, NOT raising the levels.

From Susan Hill Clay <...>
Date Monday, January 17, 2005 3:52 am
To AcousticEIS.Comments@noaa.gov
Subject NMFS: I.D. 060804F
January 16, 2005

From "Svete, Pamela" <...>
Date Monday, January 17, 2005 8:12 am
To <AcousticEIS.Comments@noaa.gov>
Subject In support of 70 FR 1871

Michael Payne, Chief
Marine Mammal Conservation Division
Office of Protected Resources, NMFS (F/PR2)
1315 East-West Highway
Silver Spring, MD 20910

In support of 70 FR 1871, Redefining Marine Mammal Taking by Anthropogenic Noise; As a trained Wildlife Biologist, I strongly suspect that recent headlines depicting mass strandings (see below for today's headlines in my local paper) are suspect to anthropogenic noise. The redefined categories based on empirical data demonstrate scientific integrity, and I see no reason why this change should not be supported.
Sincerely,
Pam Svete
Pamela Svete, M.S.
Project Manager
Tesoro Corporation

Dear Chief Payne,

Having just finished reading "Crimes Against Nature" by RFK Jr., I am sick at heart that the current Administration is so callously abusing the environment, with horrific long-term consequences, so that a few corporations can benefit short-term.

Similarly, I find it reprehensible that you would even consider RAISING the noise levels in the ocean, when it has already been proven that existing levels of decibels leave death and destruction in their wake.

WHY ARE ALL YOU AGENCIES WHO ARE SUPPOSED TO BE PROTECTING THE EARTH AND SEA AND SKIES OUT TO KILL OFF EVERY LIVING THING ON THIS PLANET?

It has been proven that there is a direct cause-and-effect relationship between whale deaths and elevated noise levels - and yet your agency wants to raise levels? That is insane, inhumane, and immoral.

Sorry I cannot mimic my words. I do not mean to raise your ire, or make you defensive. I am just pleading with you to THINK and CONSIDER THE CONSEQUENCES for the innocent animals who cannot speak for themselves, or vote.

I know God gave you a conscience, and if you listen to it, you WILL have the courage to do the right thing and stop killing God's beautiful underwater creatures.

Sincerely,
Susan Hill Clay

More whales beached in N.C. as researchers seek reasons
By STEVE STONE, The Virginian-Pilot
© January 17, 2005 | Last updated 5:35 AM Jan. 17

Two more whales were found washed up along the Outer Banks on Sunday, bringing to 34 the number that have perished along the coast since Saturday. Teams of marine biologists, fighting against terrible weather conditions, worked through the day gathering tissue and fluid samples from the whales in their effort to learn what went wrong. There are no firm answers yet. Necropsies done on many of the bodies did bring one revelation Sunday: "Three of the animals were pregnant," said Barbie Byrd, a biologist with the National Oceanic and Atmospheric Administration's Fisheries Service. Otherwise, the examinations "did not reveal anything specific, which is not unusual," Byrd said. More telling may be lab tests on tissue and fluid samples taken from many of the whales on Sunday. More samples will be taken today. Those are going out to academic labs all over the country, Byrd said. Results should begin to trickle in within two weeks, but all the results may not be available for two months. Initially, 31 pilot whales were found washed up along a five-mile stretch of beach north of Oregon Inlet on Saturday morning. A single, nine-foot minke whale also washed up Saturday in Corolla on the northern Outer Banks. It had to be euthanized. Its necropsy revealed that "it was severely emaciated, so it had not been feeding for a while," Byrd said. On Sunday, two more whales, believed to be pygmy sperm whales, were found beached near Buxton. "One was an adult female," Byrd said. "One washed up dead and the other had to be euthanized." Most of the pilot whales were already dead when found. Seven had to be euthanized because they were too badly injured to survive. "The Outer Banks gets a lot of marine strandings because it sticks out so far and is close to the Gulf Stream," Byrd said. "But never like this," she said. "This is unusual," Byrd said. "The greatest number we had at one time around here was three animals."

The last mass stranding of pilot whales in the Southeast occurred on April 18, 2003, when 28 whales washed up on a beach in Key West, Fla. Mass strandings are common in Florida and in New England around Cape Cod, Byrd said. Byrd said that while stormy weather may have guided the whales toward the Outer Banks, it's not believed to have caused the strandings. "We get nor'easters all the time. There's no evidence to suggest this is related to weather," she said. However, "if the whales were sick already, the weather could have brought them closer to shore." The weather did have a distinct impact on the work of the stranding team. Conditions were "very challenging," Byrd said, "very cold and windy." Despite that, "everyone has been very positive and enthusiastic." Still, it's not a happy task. "The people that we have here are used to this type of work, but it is sad to see all these animals," Byrd said. All the teams can do is "try to stay focused on the job at hand and not try to think about it too much." About 40 members of the NOAA-led Southeast U.S. Stranding Network team were on the beaches Sunday, working at more than 10 sites. "We will stay here until all the animals are worked up," Byrd said. Byrd said five of the whales, all dead, washed out to sea in rough surf at high tide on Sunday. About 10 also washed away on Saturday. The rest are to be buried near where they remain. "The National Park Service will be using heavy equipment to bury them," Byrd said, "deep, deep, deep on the beach." Reach Steve Stone at 446-2309 or steve.stone@pilotonline.com.

-----ALSO, Partial article-----

Secrets of the Ooad: Loss, survival and the search for answers inside whales
By DIANE TENNANT, The Virginian-Pilot
© December 5, 2004

"This is what we have. A sei whale," said Susan Barco. "It's a male." The whale lay on the beach at Little Creek. A cluster of Seabees stood downwind, hands cupped over their noses. The boat that had towed the carcass in killed just offshore. A pickup truck from the Virginia Marine Science Museum was parked on the sand. The whale belonged, technically, to the federal government, which is charged with protecting them, but with dead, stranding whales, it's realistically finders keepers. This was Barco's whale now, all 36 feet and 30 tons. It was as long as a school bus and three times heavier. She intended to cut it up. Barco is tall and broad-shouldered, with a short ponytail that keeps losing wisps that fall in her eyes. She wears navy blue T-shirts with "Stranding Team" across the back in white block letters, much as federal agents sport "FBI" or "ATF" on big jobs. And this was a big job. Her T-shirt was covered this day in February 2003 with yellow rubber overalls. A cold wind blew off the Chesapeake Bay, coating Barco's wire-rimmed glasses with raindrops. She didn't mind much. Sunlight, beating down on black skin underlain with 6 inches of blubber, coaks efficiently, but it doesn't smell good. Some people dab Vicks VapoRub under their noses to combat the odor, but Barco long ago overcame any inclination to retch. It was mid morning, and the biological clock was ticking. The whale was decomposing, and the samples of muscle and blubber and bone that she would collect for scientists across the country were losing their integrity. Barco, the museum's stranding program coordinator, selected an enormous carving knife from a metal table set up on the sand. "You'll be amazed at what comes out of this whale," she said, as she sharpened the blade on a whetstone. Carcasses of marine mammals have probably washed up on beaches for millions of years, since the first dog-like ancestors slipped into the water. They evolved their noses to the tops of their

heads and their hind legs into powerful tails, but they remained mammals. They must breathe air, they must stay warm in cold water, and they must feed their calves with milk. They live in the water, but they die, sometimes, on the beach, under the crush of their own suffocating weight. When they do, the carcasses draw scavengers like flies and gulls and scientists. As early as 1764, a naturalist published a detailed drawing of a stranded sperm whale in the Netherlands. By 1839, enough had been learned from dead animals to allow a surgeon to publish "The Natural History of the Sperm Whale." But the biggest creatures on earth are still the least known. We don't know where they migrate or how deep they dive. We don't know how they see, hear, move, sing. We don't even know what kinds are actually out there. On the beach and in the lab, scientists work on questions that are proving hard to answer. How do whales live? Why do they die? Can we protect them?

6

From
 Date Monday, January 17, 2005 4:43 pm
 To AcousticEIS.Comments@noaa.gov
 Subject I.D. 060804F
 To whom it may concern:

The National Marine Fisheries Service (NMFS) has a duty under the Marine Mammal Protection Act to regulate those who emit noise into the ocean. This includes the military, with their use of ordinance and sonar; the oil and gas industry with their seismic explorations; and research scientists who use seismic energy to study the oceans. The current maximum noise level that NMFS use in their authorizations is 180dB SPL.

I urge you not to revise the noise level upwards, but rather to revise it downwards. Please consider that:

Since 1997 when NMFS started using 180 dB SPL, the following strandings coincide with the use of sonar or seismic airguns: the U.S. Virgin Islands (1998, 1999), the Bahamas (2000), Madeira (2000), the Canary Islands (2002 and 2004), Baja California (2002), and the NW coast of the United States (2003);

The US Navy guidance for human divers exposed to noise is a level of 145 dB SPL. According to the US Navy in their investigation into the Bahamas stranding event, the level that the whales reacted to and died was 138 dB SPL;

Most of the scientists that are advising NMFS are navy scientist, navy contractors, or have received funding at some time from the Office of Naval Research;

The approach used to determine the new criteria disregards the long term effects of noise, does not account for noise damage to non-hearing organs, and does not take into account recent findings that suggest that certain whales get the 'bends' and die as a result of rising too quickly in response to noise levels just over background;

Over the last year, strong cautionary statements about the threat that loud ocean noise poses to marine mammals have been issued by: the European Parliament; the International Whaling Commission; the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS); the Spanish government in relation to the Canary Islands; and the World Conservation Union.

The marine mammals of the world need your help to protect them from this deadly threat.

Thank you for taking this into consideration.

Sincerely, with respect for the earth & its creatures,
 MZ

From Edward Mainland
 Date Monday, January 17, 2005 10:14 pm
 To AcousticEIS.Comments@noaa.gov
 Subject Scoping Ocean Noise Criteria: I.D. 060804F.
 For NMFS:

I note from the the Federal Register that National Marine Fisheries Service is revising its ocean noise level criteria.

It would appear that NMFS intends to revise acceptable noise levels well above those that many leading scientists believe are rational. It would be unfortunate if NMFS draws up an EIS to justify this revision by unscientifically asserting that these levels don't cause detectable and significant harm to whales and other marine mammals.

There is abundant and growing evidence, as seen in the controversy over the Navy's attempts to implement LFA and many other instances of human-caused sonic disturbance in the ocean, that the behavior patterns and physical well-being of whales, other marine mammals and, indeed, fish are being impacted negatively by the din of anthropogenic ocean noise.

This is an example where the precautionary principle -- first of all, do no harm until proven safe, and look before you leap -- would be a wise dictum.

Edward A. Mainland

8

From "karen kirschling"
 Date Tuesday, January 18, 2005 0:26 am
 To AcousticEIS.Comments@noaa.gov
 Subject I.D. 060804F - Decrease ocean noise.

To whom it may concern:

I am writing in support of lowering, NOT raising the allowable levels of ocean noise that affect marine mammals.

The National Marine Fisheries Service (NMFS) has a duty under the Marine Mammal Protection Act to regulate those who emit noise into the ocean. This includes the military ordinance and sonar use; oil and gas industry seismic explorations; and research scientists who use seismic energy to study the oceans. The current maximum noise level that NMFS use in their authorizations is 180dB SPL.

Compelling reasons to decrease the noise level criteria include the following:

Since 1997 when NMFS started using 180 dB SPL, the following strandings coincide with the use of sonar or seismic airguns: the U.S. Virgin Islands (1998, 1999), the Bahamas (2000), Madeira (2000), the Canary Islands (2002 and 2004), Baja California (2002), and the NW coast of the United States (2003);

The US Navy guidance for human divers exposed to noise is a level of 145 dB SPL;

According to the US Navy in their investigation into the Bahamas stranding event, the level that the whales reacted to and died was 138 dB SPL;

The approach used to determine the new criteria disregards the long term effects of noise, does not account for noise damage to non-hearing organs, and does not take into account recent findings that suggest that certain whales get the 'bends' and die as a result of rising too quickly in response to noise levels just over background;

Over the last year, strong cautionary statements about the threat that loud ocean noise poses to marine mammals have been issued by: the European Parliament; the International Whaling Commission; the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS); the Spanish government in relation to the Canary Islands; and the World Conservation Union.

To increase the noise would be deadly. The current limit is already damaging. Please DECREASE the noise level criteria.

Sincerely,
 Karen Kirschling

Join Excite! - <http://www.excite.com>
 The most personalized portal on the Web!

From "Sarah Dolman"
 Date Tuesday, January 18, 2005 10:24 am
 To AcousticEIS.Comments@noaa.gov
 Subject NMFS Acoustic EIS

I would like to receive the a copy of the NMFS acoustic EIS please, as I have been unable to find it on the NMFS Acoustic website. I emailed the department last week to request a copy and am yet to receive a response.

Many thanks,

Sarah Dolman
 Science Officer
 Whale and Dolphin Conservation Society (WDCS)

WDCS is the global voice for the protection of whales, dolphins and their environment.

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From "Malaka Edwards"
Date Tuesday, January 18, 2005 1:34 pm
To AcousticEIS.Comments@noaa.gov
Subject Marine noise levels

Chris,
I am writing to express my concern about the proposed ocean noise level allowance increase. The impact on ocean mammals could result in massive devastation and un-needed death. I believe that as humans it is important for us to live in tight relations to all living beings and only use our fair share of the worlds resources. I urge you to do what is in your power to maintain noise levels deemed by scientists to be in keeping with the health of ocean mammals. Thank you.
Malaka Edwards
(510) 504-0323

Malaka Edwards
People's Grocery

From LJ Lightfoot
Date Wednesday, January 19, 2005 10:24 am
To AcousticEIS.Comments@noaa.gov
Subject Sacred trust

As we have a sacred trust in stewardship of the natural world, I urge your agency to adopt policies and rules that will benefit, rather than harm, that world. Underwater cacophony is a growing problem. I urge your agency to act in ways that will enhance the well being of countless animals who are defenseless in the face of human onslaught.

Thank you,
LJ Lightfoot

From "brown pride"
Date Wednesday, January 19, 2005 12:39 pm
To AcousticEIS.Comments@noaa.gov
Subject comments for EIS on the Impact of human-made noise (such as LFA sonar) in the marine environment.

Please take all steps to eliminate most human made noise such as LFA sonar to keep oceanic eco-systems and it's animal inhabitants free from harm

Thank you,
Mr. Ravi Grover

This email was brought to you by Hindunet Mail
http://hindunet.com/

From elisa harms
Date Wednesday, January 19, 2005 12:52 pm
To AcousticEIS.Comments@noaa.gov
Subject Ocean Noise.

I want to let you know that loud noises are not good for the ocean system, especially sensitive creatures like whales and dolphins, and they should be limited or even eliminated, not increased. Do you understand that the world is being tortured and that is no way to live here?

Thank you,
Elisa Harms

Do you Yahoo!?
Yahoo! Mail - Find what you need with new enhanced search.
http://info.mail.yahoo.com/mail_250

14

15

From "barbara sachau"
Date Wednesday, January 19, 2005 1:34 pm
To
Cc

From "Julia bulla" <>
Date Wednesday, January 19, 2005 6:42 pm
To AcousticEIS.Comments@noaa.gov
Subject noise levels under-sea; I.D. 060804F

Subject: public comment on federal register of 1/11/05 vol 70 no 7 page 1871
usdoc noaa id 060804F
no1 eis

ATTN: Michael Payne, Chief, NMFS

this is not pub in proper english for full public comment. It is biased to scientists and seeks to shut out the public from commenting. Is this agency afraid of NYC - I note all meetings far far away from new york city, with its cross section and diversity of americans.

It has recently come to my attention that the NMFS is looking to revise the noise level criteria, (currently, as I understand, at 180 dB SPL), upwards.

I also note the propensity of employees/council to stay at luxury swank hotels on the taxpayers' dime. I think these meetings should properly be held in the government buildings that the taxpayers are paying hard earned tax dollars to support and I very much find it disgusting this raping of taxpayer dollars for swank hotels. I am suggesting night teleconferences where the true public can join via internet telephone calls. I think all americans have a right to comment, not just pre selected ones.

This letter serves as my request that the acceptable levels not be increased, but at least stay the same, and, rather, are decreased. I am concerned for the safety and well-being of the many creatures which are (sometimes fatally) affected by man-made ocean noise. I am, obviously, not a marine biologist and barely an amateur scientist; just a co-habiter of this planet. I trust you to send my request within the ear/eye-shot of the appropriate officials.

Sincerest Regards, Julia Baldassarl

this agency lets 100% of all who seek to destroy animals get permits to destroy them. none are prevented no matter how stupid the project or overdone the killing.

I dont think the alleged "science" is accurate to define these "levels" on page 3 of 8 at this time. Thinking any animal can still live unimpaired after the horrors human profiteers throw at them is extremely unlikely.

It is time to ban harmful noise totally. I oppose the whole project in this proposal. This issue could be settled by simply banning all noise. The status quo is no noise and we should stay at that status.

the past six years has seen much destruction of marine life from this level's use on page 5 of 8. I want a higher standard for marine animal health. What is being allowed now kills and injures. Alternative II is when death/injury occur - that is scary. All of the alternatives mentioned have issues.

I do not want temporary injury allowed either since it can result in permanent death.

comment on page 6 of 8 - the noise exposure criteria is not accurate enough at all. noise kills through hemorrhaging of the brain/ear canal.

b. sachau

On the road to retirement? Check out MSN Life Events for advice on how to get there! <http://lifeevents.msn.com/categories.aspx?cid=Retirement>

<http://hqmmail.nmfs.noaa.gov/frame.html>

3/17/2005

<http://hqmmail.nmfs.noaa.gov/frame.html>

3/17/2005

Page 1 of 1

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From Mark Palmer
Date Wednesday, January 19, 2005 11:47 pm
To AcousticEIS.Comments@noaa.gov
Subject Statement I.D. 060804F

Attachments [NMFS Noise Level QRAL 1-05.doc](#)

40K

P. Michael Payne, Chief
Marine Mammal Conservation Division
Office of Protected Resources, NMFS

Dear Mr. Payne:

Attached is a copy of my statement submitted to the San Francisco scoping meeting.

Thank you.

-- Mark J. Palmer, Assistant Director

"I have never made but one prayer to God, a very short one: 'O Lord, make my enemies ridiculous.' And God granted it."
--Voltaire

Mark J. Palmer
Assistant Director
International Marine Mammal Project
Director
Wildlife Alive

Statement by Mark J. Palmer,
Assistant Director
International Marine Mammal Project
EARTH ISLAND INSTITUTE

National Marine Fisheries Service
Scoping Meeting:
Criteria for Marine Mammal Exposure to
Anthropogenic Noise
in the Marine Environment

San Francisco, January 18, 2005

Statement by Mark J. Palmer, Assistant Director
International Marine Mammal Project
EARTH ISLAND INSTITUTE

National Marine Fisheries Service Scoping Meeting:
Criteria for Marine Mammal Exposure to Anthropogenic
Noise in the Marine Environment

San Francisco, January 18, 2005

<http://hqmmail.nmfs.noaa.gov/frame.html>

3/17/2005

My comments today are in support of the National Marine Fisheries Service (NMFS) reducing noise levels underwater received by marine mammals to 120 dB in pulses, or 100 dB in continuous noise or pulses, for the reasons outlined below. This is in keeping with the proposed NMFS noise criteria Alternative II, although with important differences.

Concerns for scoping meeting dates:

I wanted to express my concerns over the short notice for these scoping meetings. The Federal Register Notice is dated January 11th, with the first meeting today, January 18th, barely a week's notice (with a holiday weekend in between, too).

Specific questions for NMFS:

I also wanted to start with several questions for NMFS, as the Federal Register Notice did not provide enough information for comment on the scoping process. The Federal Register Notice discussed a process, but it did not discuss any details of expected outcomes and how those outcomes would be applied.

- We understand that NMFS has established a scientific advisory committee to address the noise level criteria. We ask that NMFS provide the names, affiliations and research funding support sources (including NMFS and the US Navy) for this scientific advisory committee, and how the advisory committee will interact with NMFS to provide the noise criteria.
- What is the relationship between the NMFS process and the current review of noise criteria being conducted by the Marine Mammal Commission Advisory Committee? Will the NMFS process incorporate recommendations from the MMC Advisory Committee?

of noise, is unknown. Most suppositions are based on tenuous data. It is therefore important that we set noise levels for marine mammals at conservatively low levels at this time. Only when solid research demonstrates that higher levels are not harmful should NMFS noise guidelines be updated to allow higher levels.

Sound impacts vary by species, habitat, and behavior. BUT uniform standards are necessary for enforcement purposes

A further consideration is enforcement of the MMPA and prevention of sound damage to marine mammals. We certainly understand that sound impacts underwater will vary substantially according to many different parameters: By species involved; by habitat types, including water temperature, density, salinity, and especially seafloor characteristics; and by behavior, age and other individual characteristics of marine mammals.

However, it is also important to have reliable and uniform standards which are easily understood and, at the same time, enforceable by NMFS. Complicated formulas and assumptions, as well as species-by-species guidelines are not an acceptable substitute for a broad set of noise level criteria that apply in all oceans at all times, in our opinion.

Only in very limited circumstances (e.g. a construction project near a specific species of marine mammal, such as a harbor seal haul-out area) would justify limited species-specific noise criteria, in our view.

Unfortunately, NMFS has chosen to issue "small take" permits to incredibly sweeping marine noise emission projects, such as very intense military sonars and seismic testing for oil companies which blast sound over thousands of miles underwater. These projects encompass a bewildering array of species, geographic

• Which of the alternatives proposed for scoping is the NMFS preferred alternative? 6

• For which species specifically will acoustic data be "extrapolated"? (E.g. for which species does NMFS feel data is inadequate to assign specific data?) 7

What do marine mammals use sound for?

We know that marine mammals are acoustic animals, using sound underwater to communicate, navigate, hunt and feed, and for orientation. Other sensory cues are limited -- sound is the major, most important sense that allows marine mammals to exist in the ocean medium.

Concern for other marine life, not just marine mammals

I also want to re-state our concern for other marine life and the adverse effects of anthropogenic sound on a wide array of species. Indeed, we believe that further research will show many marine species, including commercially important species of fin fish and shrimp, are more susceptible to noise damage than marine mammals. As noted by the reports of the National Research Council on ocean noise and marine mammals, because other marine species are part of the food chain for marine mammals, the susceptibility of these species to ocean noise also has direct and indirect effect on marine mammals.

Concern for Precautionary Principle

Our recommendations for noise levels are also based on the Precautionary Principle. A great deal about noise levels received by marine mammals and marine mammal reactions, including damaging and lethal levels

habitats, and changing ocean circumstances, all of which suggest uniform noise guidelines would be superior for protecting marine mammals, encouraging industry and military adherence to noise criteria, and, when necessary, enforcement action by NMFS.

Federal MMPA harassment definition

It is also important to address the specific issue of the Marine Mammal Protection Act's (MMPA's) definition of harassment. Too often, noise criteria and mitigation by NMFS has focused on issues of acute noise damage to marine mammals rather than protecting marine mammals from harassment due to underwater noise.

The MMPA, as noted in the Federal Register, defines harassment as:

...any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including but not limited to, migration, breathing, nursing, breeding, or sheltering (Level B harassment).

(As also noted in the Federal Register, the Defense Authorization Act significantly modified this definition for the purposes of military readiness activity or Federally sponsored scientific research.)

It is important to keep in mind the specific wording of the MMPA harassment definition, as it is clear that Congress wished to avoid harm to marine mammals by adopting very conservative, protective criteria, in keeping with public concern for the welfare of marine mammals.

Use of ear biometrics do not address all noise issues

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The proposal by NMFS to base their standards for noise levels ONLY on "exposures levels and durations that may produce either temporary or permanent shifts in hearing sensitivity" is clearly a violation of the mandates of the MMPA and not in keeping with our understanding of noise impacts.

Indeed, contrary to NMFS assertions that this approach will achieve a "more scientific basis", the proposal would ignore significant scientific research and evidence of additional impacts caused by very intense levels of noise, including:

- Evidence of very low noise levels, as low as 130 dB, causing severe damage and strandings of beaked whales and baleen whales;
- Evidence of post-cranial damage to marine mammals involved in strandings related to intense underwater noise levels;
- Potential effects of resonance in marine mammal cranial passages, in effect magnifying intense underwater noise levels, to the point of damaging tissues;
- Potential effects of rectified diffusion, with intense noise levels causing bubble formation in blood streams of cetaceans;
- Potential effects of the startling of cetaceans at depth, which then flee to the surface and suffer decompression sickness (the "bends"); and
- Low levels of underwater noise thought damaging to human divers (e.g. above 145 dB).

These types of effects cannot be determined by the NMFS method of checking threshold shifts in hearing

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As noted in my introduction, we believe a level of 120 dB received sound in pulses and 100 dB in constant sound (including repeated pulses) by marine mammals would be a conservative and valid noise level to avoid harassment. In part, this is based on research showing cetaceans aware of and reacting to noise impulses in the range of 90-110 dB.

Bahamas beaked whale strandings

Additional support for this level of underwater noise comes from scientific research related to the multi-species strandings of beaked and minke whales in Bahamas on March 15, 2000.

The *Bahamas Journal of Science* reports the conclusions of Kenneth Balcomb and Diane Claridge that "(a)version evidently and repeatedly occurred for these cetaceans at levels of somewhere between 140 and 180 dB ... (probably nearer the former)..."

The calculated received noise levels in that incident were further reduced in follow-up work by Balcomb and John Hildebrand of Scripps Institution of Oceanography and reported at the Third Plenary Meeting of the Advisory Committee on Acoustic Impacts on Marine Mammals in San Francisco. Their modeling of the event suggest a mean level of exposure to noise in the range of 130-140 dB, and extremely unlikely that exposures louder than 160 dB occurred. Again, I stress these levels induced severe tissue damage and strandings of the cetaceans in that incident, far below a level for "harassment."

Low Frequency Noise Experimentation in Hawai'i and California

As part of the research conducted during the NMFS approval process for the deployment of the Acoustic Thermometry of Ocean Climate (ATOC) low frequency sound

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levels in marine mammal ears. To ignore these other lines of evidence is clearly unscientific.

Human divers "safe" level of 145 dB

The US Navy has determined a "safe" level of underwater noise for human divers at 145 dB, based on concerns for adverse effects on humans at higher levels of noise.

It has been assumed by NMFS that humans would be LESS adversely affected by underwater noise than marine mammals. However, the opposite conclusion is also possible:

- The level the Navy recommends for humans is a "safe" level that would not cause direct permanent harm, but the MMPA calls for no "harassment" of marine mammals, a much lower biological standard than proving physical harm.
- Humans do not dive to depths that marine mammals routinely dive to, so that sound impacts at depth, that may be considerably larger than at the surface, may not apply to humans but would become dangerous for marine mammals.
- As humans are not aquatic animals, measurable impacts on humans from underwater sound may in fact result from sound levels quite a bit higher than marine mammal impacts.

Whale startle response at 90 - 110 dB

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device and other related research, several experiments were conducted using low frequency sound in the vicinity of whales in Hawai'i and California.

Some avoidance behavior and behavioral changes in surfacing was recorded under some conditions, as noted by the National Research Council's (NRC's) Committee to Review Results of ATOC's Marine Mammal Research Program. Estimated receiving level for the humpbacks was in the range of 90 to 130 dB.

Indeed, the most dramatic discovery was that male humpback whales ceased "singing" during periods of playback of 120 to 150 dB received levels. This is in keeping with several other studies showing reduced vocalizations in cetaceans during periods of anthropogenic sound transmission in their environment.

It should also be noted that claims by researchers that the combined data showed "no reaction" from whales due to these experiments was rejected by the NRC Committee, for example: "The Committee questions whether a conclusion this broad can be reached at this time using the data provided. The report does, in fact, present evidence for some short-term behavioral changes in response to the ATOC sound source by humpback whales."

Conclusion: Sound Levels Maximum 100 dB for constant noise; 120 dB for pulse noise

In conclusion, the existing evidence suggests that a 120 dB received sound level in pulses, and 100 dB for constant underwater noise (including repeated pulses), would address current concerns for the welfare and avoid harassment of marine mammals. These levels are considerably lower than current levels, but the scientific data for strandings in relationship to use of intense noise sources combined with limited experimental work with very low levels of sound showing

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From "Catherine McClintock"
Date Friday, January 21, 2005 8:18 am
To <AcousticEIS.Comments@noaa.gov>
Subject NMFS: I.D. 060804F

17

short-term behavior changes all suggest these levels meet the criteria of the MMPA.

Current NMFS sound levels cannot be justified by scientific research. The assumption that threshold shift data will establish "safe" levels of underwater noise for marine mammals is flawed and does not comport with experimental data.

It is important that NMFS take this opportunity to reduce noise level criteria for marine mammals to levels that are in line with the best available science.

Please lower the allowable levels of ocean noise that affect marine mammals not raise the levels.

Since 1997 when NMFS started using 180 dB SPL, the following strandings coincide with the use of sonar or seismic airguns: the U.S. Virgin Islands (1998, 1999), the Bahamas (2000), Madeira (2000), the Canary Islands (2002 and 2004), Baja California (2002), and the NW coast of the United States (2003);

The US Navy guidance for human divers exposed to noise is a level of 145 dB SPL; According to the US Navy in their investigation into the Bahamas stranding event, the level that the whales reacted to and died was 138 dB SPL;

Most of the scientists that are advising NMFS are navy scientist, navy contractors, or have received funding at some time from the Office of Naval Research;

The approach used to determine the new criteria disregards the long term effects of noise, does not account for noise damage to non-hearing organs, and does not take into account recent findings that suggest that certain whales get the 'bends' and die as a result of rising too quickly in response to noise levels just over background;

Over the last year, strong cautionary statements about the threat that loud ocean noise poses to marine mammals have been issued by: the European Parliament; the International Whaling Commission; the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS); the Spanish government in relation to the Canary Islands; and the World Conservation Union.

Thank you for your consideration.

Sincerely,

Catherine McClintock

10

http://hmail.nmfs.noaa.gov/frame.html

1/21/2005

Page 1 of 1

Page 1 of 2

From
Date Saturday, January 22, 2005 11:08 am
To AcousticEIS.Comments@noaa.gov
Subject NMFS: I.D. 060804F
To whom this may concern:

18

The National Marine Fisheries Service (NMFS) has a duty under the Marine Mammal Protection Act to regulate those who emit noise into the ocean. This includes the military, with their use of ordinance and sonar; the oil and gas industry with their seismic explorations; and research scientists who use seismic energy to study the oceans. The current maximum noise level that NMFS use in their authorizations is 180dB SPL.

NMFS is looking to revise the noise level criteria, upwards. I join MANY others in arguing against this move for the following reasons:

- Since 1997 when NMFS started using 180 dB SPL, the following strandings coincide with the use of sonar or seismic airguns: the U.S. Virgin Islands (1998, 1999), the Bahamas (2000), Madeira (2000), the Canary Islands (2002 and 2004), Baja California (2002), and the NW coast of the United States (2003);
The US Navy guidance for human divers exposed to noise is a level of 145 dB SPL;
According to the US Navy in their investigation into the Bahamas stranding event, the level that the whales reacted to and died was 138 dB SPL;
Most of the scientists that are advising NMFS are navy scientist, navy contractors, or have received funding at some time from the Office of Naval Research;
The approach used to determine the new criteria disregards the long term effects of noise, does not account for noise damage to non-hearing organs, and does not take into account recent findings that suggest that certain whales get the 'bends' and die as a result of rising too quickly in response to noise levels just over background;
Over the last year, strong cautionary statements about the threat that loud ocean noise poses to marine mammals have been issued by: the European Parliament; the International Whaling Commission; the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS); the Spanish government in relation to the Canary Islands; and the World Conservation Union.

The marine mammals of the world need our help to protect them from this deadly threat. Please reconsider your revisions to increase the noise level criteria.

Thank you for your time and consideration.

Sincerely,
Karen Salzgeber

http://hmail.nmfs.noaa.gov/frame.html

1/22/2005

From jh
Date Tuesday, January 25, 2005 1:00 pm
To AcousticEIS.Comments@noaa.gov
Subject I.D. 060804F PLEASE DO NOT ALLOW AN EVEN HIGHER RAISE IN THE NOISE LEVEL !!!!

19

Michael Payne, Chief, Marine Mammal Conservation Division, Office of Protected Resources, NMFS (F/PR2), 1315 East-West Highway, Silver Spring, MD 20910

regarding I.D. 060804F

The marine mammals of the world are washing up on beaches because we are destroying their sonar capabilities with high noise levels through naval procedures !! PLEASE DO NOT ALLOW AN EVEN HIGHER RAISE IN THE NOISE LEVEL !!!!

Since 1997 when NMFS started using 180 dB SPL, the following strandings coincide with the use of sonar or seismic airguns: the U.S. Virgin Islands (1998, 1999), the Bahamas (2000), Madeira (2000), the Canary Islands (2002 and 2004), Baja California (2002), and the NW coast of the United States (2003);

The US Navy guidance for human divers exposed to noise is a level of 145 dB SPL;

According to the US Navy in their investigation into the Bahamas stranding event, the level that the whales reacted to and died was 138 dB SPL;

Most of the scientists that are advising NMFS are navy scientist, navy contractors, or have received funding at some time from the Office of Naval Research;

The approach used to determine the new criteria disregards the long term effects of noise, does not account for noise damage to non-hearing organs, and does not take into account recent findings that suggest that certain whales get the 'bends' and die as a result of rising too quickly in response to noise levels just over background;

Over the last year, strong cautionary statements about the threat that loud ocean noise poses to marine mammals have been issued by: the European Parliament; the International Whaling Commission; the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS); the Spanish government in relation to the Canary Islands; and the World Conservation Union.

http://hmail.nmfs.noaa.gov/frame.html

1/25/2005

PLEASE DO NOT ALLOW AN EVEN HIGHER RAISE IN THE NOISE LEVEL III!

Sincerely,
Jana Harker

From Jody Wolfe
Date Sunday, January 30, 2005 5:13 pm
To <AcousticEIS.Comments@noaa.gov>
Subject Sonar
Dear Sirs and Madams,

I am writing to submit my opinion as a United States citizen. Any human-made devices, including sonar, that cause the death of another species should not be used. Period.

Thank you,
Jody Wolfe

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Do you Yahoo?
Yahoo! Mail - Easier than ever with enhanced search. Learn more.
http://info.mail.yahoo.com/mail_250

<http://email.mfr.noaa.gov/frame.html>

3/17/2005

<http://email.mfr.noaa.gov/frame.html>

3/17/2005

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From "Kimberly A. Amaral"
Date Wednesday, February 2, 2005 10:53 am
To acousticEIS.Comments@noaa.gov
Subject I.D. 060804F
Dear P. Michael Payne,

From "Janice Fitzgerald" <
Date Wednesday, February 2, 2005 6:03 pm
To <AcousticEIS.Comments@noaa.gov>
Subject ocean noise levels

I would like to submit comments regarding the upcoming acoustic EIS. However, I first wanted to write and request a second attempt at a public comment session originally scheduled for Boston at the New England Aquarium on Tuesday, January 25, 2005.

I am writing because I am concerned with our ocean's wildlife. I am against tampering with the noise level laws. I understand that whales are beaching themselves with blood coming from them because of the noise problem we already have. It should be made stricter not more lax. This administration is the enemy of everything that breathes, grows and lives. Their form of "morality" is a sick joke played out on the planet.

Rev. Janice Fitzgerald

You may be aware that a blizzard struck the area Sunday into Monday (Jan. 22-23), leaving record snowfalls throughout the state. Travelling throughout that week was extremely tough--schools were closed for the entire week and non-emergency personnel were advised not to drive earlier in the week.

Due to the impact of weather or driving/parking conditions in Boston, I've been informed that only seven people attended the public comment session as originally scheduled and held. This can hardly count as an effective public comment session, and I hope that you will be scheduling another in the area, as I think this is a topic of serious interest by the public.

Thank you,
Kimberly Amaral

--
Kimberly Amaral, Research Assistant
Biology Department
Woods Hole Oceanographic Institution

<http://email.mfr.noaa.gov/frame.html>

<http://email.mfr.noaa.gov/frame.html>

3/17/2005

From "Roberta Claypool"
 Date Saturday, February 5, 2005 11:47 am
 To <acousticels.comments@noaa.gov>
 Subject
 We need the US Government needs to leave the levels of ocean noise as they are. We do not need more noise to affect our marine mammals

1

From "Jane Marshall"
 Date Monday, February 21, 2005 10:43 pm
 To <AcousticEIS.Comments@noaa.gov>
 Subject NMFS noise level

I have just been informed that the National Marine Fisheries Services is contemplating raising the noise level allowed in ocean testing for the Navy and oil and gas companies looking for deposits. If whales are reacting and beaching themselves when the noise level is 138 dB, why would this organization consider raising it even this high. I understand that the level is going to be raised above the allowable, now too high, 180 dB. I would strongly recommend lowering the noise level allowed to 100 rather than killing more marine animals.
 Jane Marshall

1

http://mail.nmfs.noaa.gov/frame.html

2/27/2005

From Dave Mellinger
 Date Tuesday, February 22, 2005 7:03 pm
 To <AcousticEIS.Comments@noaa.gov>
 Cc: Brandon.Southall@noaa.gov
 Subject I.D. 060804F

Here are my comments on the "Notice of Intent to Prepare an Environmental Impact Statement," Federal Register Vol. 70, No. 7, pp. 1871-5, I.D. 060804F. The abbreviations used here are as in that notice.

* In Alternatives IV, V, and VI, what is the justification for including only TTS and PTS in the criteria for Level B harassment? Doing so appears to ignore the terms of the MMPA, which defines Level B harassment (for academic and military use, the more relaxed standard) as "disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered." These Alternatives plainly define Level B harassment too narrowly to fulfill the requirements of the MMPA.

1

* Similarly, in Alternatives III through VI, what is the justification for including only TTS and PTS in the criteria for Level A harassment? The MMPA defines Level A harassment as "any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild." Certainly TTS and PTS count as injury, but indirect effects of noise -- such as diversion from a critical feeding ground -- can injure and kill marine mammals too. Again, these Alternatives are plainly too narrow to fulfill the requirements of the MMPA.

2

* In comparing Alternatives IV through VI, what are the criteria for deciding whether PTS onset minus 6 dB, PTS onset, or PTS onset plus 6 dB should be used as the standard for Level A harassment? No rationale for choosing between these is given. Similarly, what are the criteria for deciding whether Level B harassment occurs at TTS onset minus 6 dB, TTS onset, or PTS onset minus 6 dB?

3

* Alternative II is described as "very conservative," but it appears that it fulfills the terms of the MMPA: "takes would occur at the SPL at which the most sensitive species first begin to show a behavioral response." This sounds very much like the MMPA for non-academic and non-military uses, for which a take is defined as "disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering." What justification is there for relaxing the language of the MMPA, as is done in the other Alternatives?

4

* The effects of masking appear not to be covered in the description of Level B harassment. But masking could well be a significant effect for some noise sources, particularly for noise sources that persist for weeks to months like shipping, drilling and production of oil and gas, wind farms, etc.

5

* Five functional hearing groups of marine mammals are defined, with some exceptions allowed. Given how much remains to be learned about marine mammal hearing, is there any provision for future splitting of these groups into more numerous categories? For instance, some beaked whale species appear to respond to some military sonars differently (and more fatally) than other cetaceans, and one could argue that these species deserve their own category.

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* The guidelines mention seals and sea lions as the pinnipeds. Are odobenids (walrus) included too? Also, where are sea otters and marine otters covered?

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* Setting exposure levels is to rely on extrapolation. Some examples of this extrapolation are given, but no overall extrapolation procedure is given, and it is not clear how the extrapolation

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2/27/2005

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2/27/2005

process will work.

* The proposed methods will result in a set of decibel levels for each of the five functional hearing groups and each of the four categories of noise. Setting a decibel level is relatively simple, but it does not at all capture the complexity of marine mammal responses to noise. Is any provision made for other measures, such as nature of the sound? Some sounds are clearly more disturbing to animals than other sounds in the same frequency band. For instance, recordings of killer whale calls have a larger behavioral effect on most marine mammals than, say, broadband pulses that have the same decibel level and spectrum. Where is provision made for such effects? Another example is that argon pulses, at a distance, sound similar to male fin whale pulse sequences, and could thus have a larger effect on fin whale mating than, say, continuous sounds of the same overall energy level and spectrum.

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* Because of the variability and complexity of marine mammal responses to various types of noise, if standards are based only on decibel levels, a large measure of conservatism (20 dB? 40 dB?) should be incorporated into the standards.

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* Avoidance reactions appear to be the only types of reaction covered under Alternative III. Avoidance occurs at high sound levels, but other effects at lower levels are significant too. Other changes in behavior should be given attention, including changes in feeding behavior, effects on mother-child interactions, effects on mating behavior and social interactions, etc. In fact, the NRC (2003) said, "Behavioral responses range from subtle changes in surfacing and breathing patterns, to cessation of vocalizations, to active avoidance or escape from the region of the highest sound levels." Other effects than avoidance should be considered too.

11

* Stating that Level B harassment occurs when there is 50% behavioral avoidance reaction is unclear. Does this mean that 50% of all extant members of a species must show avoidance? Or 50% of a stock, as stocks are defined by NMFS or the IWC? 50% of a pod, a haulout, or some other size of group? Or just a 50% probability of a reaction by an individual? If the latter, at what distance is the animal assumed to be? For any given noise source, some individuals will be nearby and some will be distant; the nearby ones typically receive more sound and are likelier to respond.

12

* The 50% standard is also not very conservative. In practice, it means that noise emitters will do the statistics and use the sound level at which 49% of the target population is estimated to have an avoidance reaction. Essentially half of the population can be disturbed -- perhaps driven away from an important food source or nursery area -- and it doesn't, under this standard, even register as behavioral disturbance.

13

* How was the decided that the percentile to use for behavioral avoidance is the 50th percentile? Perhaps by analogy to LDS-50 measurements of responses to toxic substances? But LDS-50 values are typically used only as a starting point, with actual exposure levels being set at a small fraction of the LDS-50 value. That was not done here, and indeed no rationale for the 50% level is given.

14

* No door is left open for stress hormone measurements to enter the decision-making process. Stress hormone research is still in its early stages, but it holds promise. Again, the NRC (2003) said the same thing: "determining the contribution of noise exposure to [hormonal] stress indicators will be very difficult but important to pursue in the future when the techniques are fully refined."

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* Alternative IV is described as more conservative than human noise standards, in that human standards allow some PTS from cumulative effects over a lifetime. But NMFS does not issue permits based on cumulative effects over a lifetime; it issues permits for individual projects, which typically last days to at most several years -- far shorter than the lifetime of most marine

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2/27/2005

mammals. How can NMFS (or anyone) possibly estimate cumulative lifetime exposure in wild animals?

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* Are cumulative effects from the multitude of different noise sources (natural and anthropogenic) incorporated into NMFS's decision making? If so, how? Do permit applications that arrive earlier have rights to expose marine mammals to greater levels than applications that arrive later?

17

* In the Federal Register notice, what does "a relatively conservative estimate of PTS as 40 dB of TTS" mean?

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Thank you for your attention to these comments.

Sincerely,

Dr. David K. Mellinger
Assistant Professor, Senior Research
Cooperative Institute for Marine Resources Studies
Oregon State University

From "Saund Vivian"
Date Tuesday, March 1, 2005 9:57 am
To AcousticEIS.Comments@noaa.gov
Subject Noise Pollution
Dear Madam/Sir,

26

I am against seismic, ordinance and sonar explorations that kill and or injure marine mammals. Computer advancements and visionary scientists must be capable of better and humane testing using digital investigations.

1

Yours truly,
Saundra Vivian

http://small.mfc.noaa.gov/frame.html

3/1/2005

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From
Date Tuesday, March 1, 2005 4:28 pm
To AcousticEIS.Comments@noaa.gov
Subject Marine Mammals

Please do NOT raise the allowable ocean noise levels. Do not put our marine mammals in more danger than they are now. Studies have proven that increased sonar has a detrimental effect on whales and other marine mammals. They cannot speak to protect themselves. We must now allow increased harm to come to them. Humans only 'rent' the earth from future generations. We must respect and protect our environments.

1

Georgina Lentini

http://small.mfc.noaa.gov/frame.html

3/1/2005

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From
Date Monday, March 7, 2005 12:59 pm
To AcousticEIS.Comments@noaa.gov
Subject I.D. 060804F
Attachments Acoustic_Criteria_comments.doc

32K

Dear NMFS:
Thank you for the opportunity to comment on the Acoustic Exposure Criteria EIS. Attached are my comments. If possible, I would prefer an acknowledgment of receipt.

Sincerely,
Lindy Wellgart

Lindy Wellgart, Ph.D.
Research Associate and Assistant Professor
Department of Biology
Dalhousie University

http://small.mfc.noaa.gov/frame.html

3/1/2005

http://small.mfc.noaa.gov/frame.html

3/1/2005

by

Linda Weilgart, Ph.D.

7 March, 2005

My expertise is in the field of whale bioacoustics, having studied whale vocalizations for my M.Sc., Ph. D., and for my post-doctoral work. I have been active in the issue of underwater noise and its effects on marine mammals since 1994. I am an alternate member of the Marine Mammal Commission's Advisory Committee on Acoustic Impacts on Marine Mammals and a member of its Subcommittee on Management and Mitigation.

I support Alternative II, which I understand is the most conservative option. I find it nothing short of remarkable that of the six options, only one is more conservative than the status quo, namely Alternative II. This, despite all the new scientific evidence indicating that we have grossly underestimated the impact of at least some types of underwater noise on at least some groups of marine mammals. Despite all the grandiose talk of employing "science-based" acoustic criteria supported by "empirical data", there is not a single scientific expert (myself included) that, to my knowledge, predicted that beaked whales would react to mid-frequency sonar (and perhaps seismic) by hemorrhaging throughout their bodies and washing up dead on beaches. I guess the extrapolations from dolphins and humans didn't quite cover that scenario. Yet that is precisely what happened and continues to happen while scientists tinkered with their noise exposure formulae.

From the proposed alternatives, one could easily conclude that, according to NMFS and the experts on its panel, such strandings never happened. At least, I see no evidence of this alarming phenomenon being incorporated, in a precautionary way, into these proposed alternatives. If one is to engage in the very risky process of extrapolations, why not start with the known lethal reaction of beaked whales to moderate received levels of mid-frequency sonar and extrapolate this degree of sensitivity to all other marine mammals? I see no scientifically defensible reason why extrapolations only seem to be employed in a less conservative direction. Considering how little we know of the lives of whales, I find the use of extrapolations in this Notice of Intent highly inappropriate and premature. It is in the very infancy of studying diving behavior in marine mammals, we would have extrapolated from human diving behavior, a picture highly aberrant from reality would have emerged.

The focus of the noise exposure criteria seems to be nearly exclusively on PTS and TTS. While direct auditory damage is probably the easiest impact to model, it represents a tiny fraction of the likely total impacts on the organisms and the environment. Behavioral impacts which can affect the long-term health of populations seem to be given short shrift. There appears to be little acknowledgment of the possibility that modest exposure to noise could have negative population consequences, despite evidence from several scientific studies of noise on fish (e.g. Lagardere 1982, Scholtz and Yan 2002, Smith et al. 2004). There is also absolutely no treatment of non-auditory effects as have been proposed for beaked whales and other deep divers. What is the rationale for entirely ignoring this potentially important phenomenon?

Dividing marine mammals into five functional hearing groups once again places the emphasis only on direct auditory damage. Why not divide marine mammals into groups by the depths of their dives? That is a good reason to believe that deep divers are more vulnerable to noise impacts and should be treated separately (e.g. Houser et al. 2001).

Even if the focus is almost entirely on PTS and TTS, this Notice of Intent seems to gloss over the fact that PTS has never been studied in marine mammals, that only a handful of studies have examined TTS in marine mammals and never in the wild, and that, indeed, we don't even have empirical knowledge of what most cetaceans can actually hear. Moreover, any calculation of exposure presupposes that one knows where the animal is located in the sound field. Unless one plans to tag each individual with an acoustic tag, I see no way of accurately determining noise exposure. In short, there is a huge amount of guesswork in this process. While this may be unavoidable, there is no excuse for abandoning precision in the face of such vast uncertainty.

I do not believe that science is as clear-cut as the above colleague claims. My interpretation of the science is that we are a long way from understanding the full consequences of noise on the marine environment. We are unable to ascertain which levels will safeguard marine mammal populations in all, or even most, circumstances, and as such, we should strive to make our acoustic "footprint" as small as possible. Only Alternative II brings us closer to that end.

References

Anderson, F. R. 2003. Improving scientific advice to government. Issues in Science and Technology (Spring 2003), pp. 34-36.
Houser, D. S., R. Howard, and S. Ridgway. 2001. Can diving-induced tissue nitrogen supersaturation increase the chance of acoustically driven bubble growth in marine mammals? J. Theor. Biol. 213: 183-195.
Lagardere, J.P. 1982. Effects of noise on growth and reproduction of Crangon crangon in rearing tanks. Marine Biology 71: 177-185.
Scholtz, A. R. and H. Y. Yan. 2002. Effects of boat engine noise on the auditory sensitivity of the fathead minnow, *Pimephales promelas*. Env. Biol. Fishes 63: 203-209.
Smith, M. E., A. S. Kane, and A. N. Popper. 2004. Noise-induced stress response and hearing loss in goldfish (*Carassius auratus*). J. Exper. Biol. 207: 427-436.

Alternative II defines Level B harassment as occurring when there is 50% avoidance by a species or animal group. While such behavior would certainly suggest harassment, I can readily imagine scenarios whereby animals are harassed but choose to stay because they have encountered a large patch of prey. There may be negative impacts to staying, but these must be balanced against other needs the animals must fulfill. As such, it is difficult to determine whether a particular, short-term response to noise (such as abandonment or staying) translates into a threat to a population's health. Incidentally, Table 2 shows Level B harassment under Alternative II to occur at 160 dB for grey whales, based on studies by Malmgren et al. (1983, 1984). I understood these studies to show 50% avoidance at around 120 dB, not 160 dB, for continuous noise.

It is disturbing that effects on the ecosystem seem to be ignored under these acoustic exposure criteria. The marine ecosystem is poorly understood and complex. Nevertheless, impacts from noise that affect ecological processes could well be occurring and must be considered, as these could indirectly affect marine mammals. Moreover, cumulative and synergistic effects need to be taken into account if one is concerned with truly protecting the marine environment. Marine mammals face many stressors which may be exacerbated by noise. As such, Alternative II is the most appropriate option as it incorporates more precaution.

While the duration of exposure is an important factor in determining the level of impact, I am not convinced that the manner in which duration is handled by some of the Alternatives is sufficiently conservative. Once again, there is almost no hard data upon which to base management. Are cetaceans more affected by a quieter noise over a longer period of time vs. a louder sound with a shorter duration? We are unable to say.

A "science-based" approach to management based on "empirical data" requires that all reasonable interpretations and explanations of the results be considered and viewed in light of the limitations of a particular study. All scenarios of possible impacts need to be contemplated. I believe this Notice of Intent falls in this regard. There is a myopic preoccupation with direct auditory damage to the exclusion of practically all other impacts. Just because there are more readily obtainable (most captive animals), does not mean they are the most important for the conservation of marine mammals. It is poor science to ignore other studies that do not fit into your "scheme". The failure to incorporate the work on beaked whales and sonar into these acoustic criteria is a grave omission. Equally lost is the cautionary lesson this phenomenon should have taught us, the scientists as well as the managers.

Unfortunately, the composition of the Acoustic Exposure Criteria panel of experts included no beaked whale specialist. Representation on the panel did not reflect the diversity of viewpoints in the scientific community. In addition, the Acoustic Exposure Criteria process suffered from a lack of transparency. Despite the relevance to many members of the public, there was no public oversight and as such, the outcome is likely to be viewed with skepticism and suspicion. For instance, a simple request for a listing of funding sources of panel scientists, made by a member of the Advisory Committee on Acoustic Impacts on Marine Mammals in April 2004, has been only partially fulfilled. Such accountability appears to be standard among the Scientific Advisory Boards of the EPA, where panel members are diligently screened for conflicts of interest (e.g. Anderson 2003). In contrast, the Acoustic Exposure Criteria panel is vulnerable to charges of conflict-of-interest, as major noise producers, such as the U.S. Navy, have heavily funded panel members' research and one panel member is employed by the U.S. Navy. The Advisory Committee member's above request for a listing of funding sources resulted in a highly defensive reply by the director of the NMFS Acoustic Program. His e-mail response is quoted below, as distributed to the Advisory Committee 20 July 2004:

"...I was fully trained in the use of the scientific method, and my funding sources became irrelevant. Unlike lawyers, scientists don't take money to espouse some one else's viewpoint. We take money so that we can apply the scientific method to topics of research. The scientific method does not allow the use of personal (or sponsors') opinions because its goal is to reach objective truth. The Curriculum Vitae, a list of products resulting from use of the scientific method, also contains no personal or sponsors' opinions. Therefore, it is disingenuous to ask for our CVs on the pretext of "evolving conflict of interest." There is no conflict when the scientific rules of evidence are applied, science shows what it shows. The only conflict is whether people "like" what science shows, and that is what this request for sources of funding is about. One FACA committee member is trying to discredit our noise exposure criteria through the tired myth that government funding automatically "taints" people and their opinions. Discrediting science is a ploy by someone whose personal beliefs have been justly disproved by that science. The attempt here is particularly vicious because it calls into question the personal ethics and integrity of innocent individuals in order to get future noise policy guidelines based on something weaker than actual fact. This panel's personal wants did not enter into the creation of these criteria, and the wants of the person who forced this question should not enter into a discussion of the merits of our work."

From "Sarah Dolman"
Date: Friday, March 11, 2005 6:16 am
To: AcousticEIS.Comments@noaa.gov
Subject: WDCCS comments on preparation of an EIS for NMFS Acoustic Criteria
Attachments: [WDCCS comment NMFS Acoustic.doc](#)

Please find WDCCS comments on the scoping document in preparation of an EIS for development of NMFS Acoustic Criteria attached.

With best wishes,

Sarah Dolman
Science Officer
Whale and Dolphin Conservation Society (WDCCS)

WDCCS is the global voice for the protection of whales, dolphins and their environment.

This e-mail's contents are confidential to the intended recipient(s) at the e-mail address to which it has been sent. It may not be disclosed, copied to, circulated or used by anyone other than the intended addressee(s). If you are not the intended recipient or have received this transmission in error please telephone the originator immediately or ring +44 (0)1249 449500. Any opinions expressed in this message are those of the author and do not necessarily reflect the opinions



P. Michael Payne
 Chief, Marine Mammal Conservation Division
 Office of Protected Resources
 NMFS (FPER2)
 1315 East-West Highway
 Silver Spring
 MD 20910
 USA

WDCS International

www.wdcs.org

AcousticEISComments@noaa.gov
 LD 060804F

11th March 2005

Dear Dr. Payne

Preparation of an EIS for analysis of the potential impacts of applying a NMFS Acoustic Criteria

These initial comments are in response to the brief Federal Register Notice. WDCS was unable to attend the public consultation meetings due to the lack of notice given.

WDCS would like to support the development of a set of Acoustic Criteria that is more firmly based in science. However, we are concerned that the 'expert panel' is not representative of all interests and the work that has been conducted on the Acoustic Criteria to date has been conducted behind closed doors. WDCS were first made aware of the expert panel at the Advisory Committee on the Impacts of Noise on Marine Mammals, of which WDCS is a member.

Our primary concern is that the development of an Acoustic Criteria should remain precautionary in nature. This is particularly important given the lack of data concerning:

1. Mechanisms of injury;
2. Variable nature (i.e. physiology and behaviour) of the 83+ species of cetacean that may be affected;
3. Variable nature of the sources of noise pollution;
4. Long term, subtle and potentially undetectable, and cumulative impacts of the various sources of noise pollution and other stressors; and
5. Lack of knowledge of the effectiveness of current mitigation measures.

1. Lack of knowledge of the mechanisms of injury

It is of primary importance that consideration of impacts must go beyond those that are auditory. The notice does not recognise the recent international advances in thinking about the potential for serious negative impacts, from other physiological or behavioural responses to noise sources, or from those occurring over the long term, for those which we can not currently detect (for example, Evans *et al.* 2002; Jepson *et al.* 2002; Fernandez *et al.* 2003; Dolman and Potter, 2004).

We must acknowledge the limitations of what can be achieved using on board mitigation as a management method. It will not be possible to detect all animals that are encountered. The probability of detection will also be reduced by a series of other factors, including: operating at night; searching in rougher sea states; the number of observers; and the equipment used for monitoring¹. Therefore wider management measures including spatial and temporal restrictions must be considered as an integral part in the development of an acoustic criteria.

Significantly, in 2004, the IUCN-World Conservation Union adopted a resolution entitled Undersea Noise Pollution. It calls for urgent action by states to reduce the impacts of high-intensity naval sonar systems on beaked whales and other vulnerable species. It recognises undersea noise as a form of pollution; calls on states to avoid the use of intense noise sources in the habitat of vulnerable species or where marine mammals and endangered species may be concentrated; and urges states to work through the United Nations Convention on the Law of the Sea to develop mechanisms for the control of this emergent problem. It is critical that seasonal and geographical restrictions should be imposed during biologically important periods, and for vulnerable species.

Alternatives

We recognise that Alternative I (no action) can be improved upon. Yet, it may be that this approach cannot be discounted if the data are not sufficient to set in place an alternative model.

Alternative II appears to be precautionary but we have concerns about how it will be monitored and enforced.

Alternative III is not a conservative approach. It only considers the auditory impacts and so for the reasons stated above, it is not satisfactory at all.

Alternatives IV, V and VI are nonviable given that we are unable to detect the onset of PTS. It would be a dangerous assumption to set levels at which PTS occurs, even if these are extrapolated, as is suggested. Particularly given the points raised above, regarding behavioural and physiological impacts occurring at levels below those at which the onset of PTS and even TTS can be expected. At this time there is not enough information to ensure that harm will not come to cetaceans at increased received sound levels. Therefore Alternatives IV - VI should be eliminated and, instead, more realistic and precautionary options should be pursued in their place.

In place of these Alternatives, it would be appropriate to consider the wider management options should ensure effective protection of vulnerable species, those in areas of critical habitat, such as feeding, brooding and nursing grounds, as well as protection of mother and calf pairs.

All extrapolations, uncertainties and unknowns should be made explicit in the development of the criteria.

¹ Beaked whales are a species which can reasonably expect to be encountered in Australian waters, although we have almost no information on their distribution. Balow and Gisher (in press) have analysed US research survey data and have concluded that the overall probability of detecting beaked whales during mitigation monitoring is likely to be 24% (8 times lower than for research vessel surveys). They concluded that less than 2% of beaked whales would be detected during mitigation monitoring - if the animals were directly in the path of the ship. This detection would drop to zero by ~1 km from the trackline. Whilst beaked whales are deep diving, and so the figures are likely to be most extreme for this species, it certainly highlights the limits of mitigation monitoring.

Non-auditory physiological impacts may include: physiological stress, neurosensory effects, effects on balance (vestibular response), tissue damage from acoustic resonance, gas bubble formation and/or growth in tissues and blood, and blast-trauma injury.

Events have led to the stranding and subsequent death of some beaked whale species, but are likely to be significant for other species also, including minke whales and pygmy sperm whales. Whilst at this stage very little is known about the mechanisms that led to the strandings, and whilst we acknowledge that such mechanisms will be difficult to study, they simply cannot be ignored from a management perspective.

The Notice states that it will 'use data from one species of mammals to set criteria for another species it acceptable for injury because the anatomy of the inner ear of all mammals is extremely similar'. Whilst this may be the case for auditory injury, we do not believe that such peer reviewed data are available for behavioural or physiological impacts. In fact, the best data may be that which was presented at the 3rd Advisory Committee meeting on the Impacts of Noise on Marine Mammals. Amongst other things this indicated that the beaked whales in the Bahamas during the 2000 stranding that washed ashore and ultimately died were probably exposed to levels lower than those that have been shown to cause TTS in captive odontocetes¹.

2. Variable nature of the 83+ species of cetacean that may be affected
 We are concerned that data from a few captive odontocetes will be extrapolated to set management measures for all cetacean species whose vulnerability and responses can be expected to vary greatly. Whilst the marine mammals have been grouped depending on their hearing abilities, this may not be appropriate.

3. Variable nature of the sources of noise pollution
 A thorough investigation of all noise sources is required. This should include seismic surveying, shipping, military activities (including, but not limited to, sonar exercises) and the use of active acoustic fisheries devices. Efforts should be made to ensure that all industries that may be having a significant impact on the marine environment be managed appropriately. A full independent review of the potential impacts of all sources of noise pollution on cetaceans would provide a firm knowledge basis to help determine how best to proceed with comprehensive and effective acoustic guidelines for those industries to which the legislation should apply.

4. Long term, subtle and potentially undetectable, or cumulative impacts
 We believe that the acoustic criteria should be used to ensure, to the greatest extent possible, the protection of cetaceans from harassment as well as direct physical harm. At the present time, there is very little data on any long term, subtle and potentially undetectable, or cumulative impacts of noise pollution and the acoustic criteria does not attempt to deal with these critical issues.

5. Lack of knowledge of the effectiveness of current widespread mitigation measures
 At the moment there is very little effort focused on assessing the measures of mitigation that are currently imposed. Serious effort should be invested in monitoring the effectiveness of the management measures that are currently prescribed. This should be considered in context of the different species of cetaceans as well as varying surrounding environmental characteristics.

¹ Ken Balcomb, John Hildebrand and Bob Gisher made a presentation that hypothesized received levels in the Bahamas stranding of 2000. Such levels were calculated using modelling techniques and included a number of assumptions, for example depth and position of the whales.

Where US environmental legislation is extended to the protection cetaceans outside of US waters, consultation with the appropriate international authorities and interested parties should be required.

In conclusion

WDCS would like to provide our support for the development of a set of Acoustic Criteria that is more firmly based in science. However, our key concern is that the development of an Acoustic Criteria should remain precautionary in nature. Given the concerns raised above, Alternatives IV - VI should be eliminated from the process and more precautionary options should be pursued in their place.

Such options should include our limited understanding of the mechanisms of injury; the variable nature (i.e. physiology and behaviour) of the 83+ species of cetacean that may be affected; the variable nature of the sources of noise pollution; long term, subtle and potentially undetectable, and cumulative impacts of the various sources of noise pollution and other stressors; and the lack of knowledge of the effectiveness of current mitigation measures. Also, the consideration of wider management options should ensure effective protection of vulnerable species, those in areas of critical habitat, such as feeding, brooding and nursing grounds, as well as protection of mother and calf pairs. Where US environmental legislation is extended to the protection cetaceans outside of US waters, consultation with the appropriate international authorities and interested parties should be required.

We hope these comments are helpful. Please feel free to contact us if you would like to discuss any elements in more detail. We look forward to further input as the process progresses.

Yours sincerely

Sarah Dolman

Sarah Dolman
 WDCS International Science Team

From "Cathy Uss" -
 Date Friday, March 11, 2005 5:48 pm
 To <
 Cc <
 Subject I.D. 060804F
 Attachments [AWI Comments 3-14-05.pdf](#)
 Our submission is attached.

191K

Cathy Uss, President
 Animal Welfare Institute



Animal Welfare Institute

March 14, 2005

P. Michael Payne, Chief
 Marine Mammal Conservation Division
 Office of Protected Resources, NMFS (F/PR2)
 1315 East-West Highway
 Silver Spring, MD 20910

Dear Sir:

Re: Comments on the NMFS proposal to prepare an Environmental Impact Assessment to analyze the potential impacts of applying a new criteria in guidelines to determine what constitutes a "take" of a marine mammal under the Marine Mammal Protection Act and Endangered Species Act as a result of exposure to anthropogenic noise in the marine environment.

The Animal Welfare Institute (AWI) has long followed the issue of anthropogenic ocean noise and its effects on marine life and has attended every meeting of the Marine Mammal Commission's Advisory Committee on Acoustic Impacts on Marine Mammals (Acoustic Committee), where we were first introduced to the idea of a revision to the noise exposure criteria and to the existence of the NMFS Noise Criteria Group (Noise Group), upon whose 'science', the proposed revised criteria are based.

AWI welcomes the NMFS willingness to revise the current generic noise criteria that, since 1997, have been used to determine when a take by harassment might occur. A revision is long overdue, especially in view of: 1) the many noise related marine mammal stranding events that have occurred subsequent to the introduction of the current criteria; 2) the severe lack of understanding in relation to marine mammals and their physiological and behavioral reactions to ocean noise; and 3) the growing attention that anthropogenic ocean noise is receiving in the international arena and multiple calls for caution from respected international bodies.

AWI submits the following comments in response to the above-mentioned proposal by NMFS, published in the Federal Register Notice (the Notice) of January 11, 2005.

The influence of industries on the process
 In reviewing the Notice we are struck by how far the process has become compromised by deference to the very industries that NMFS is supposed to be regulating. The agenda revealed in the document shows the Agency's desire to raise the allowable level of sound so high as to avoid the inconvenience of restricting industries that use devices that inject massive amounts of intense sound into the oceans, namely the military, the oil and gas exploration industry, and the scientific

*Comments of Animal Welfare Institute
 EIS on new anthropogenic noise criteria for marine mammals
 March 14, 2005*

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establishment. Only one of the Alternatives listed, Alternative II, which we support, even considers the actual protection of marine mammals from a precautionary standpoint. The other Alternatives range from bad (180dB, Alternative I), to worse, worse still, appalling and downright atrocious.

Instead of asking how the human use of sound in the oceans must be regulated in order to protect marine mammals, the exercise appears to be one of finding out how loud we can allow the routine discharge of sound and still keep a portion of the marine mammal populations alive. As was clear in the writing of the Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.) (MMPA), this is an agenda that is guaranteed to fail in the protection of ocean creatures.

For the NMFS to suggest these increases in allowable sound after over a decade of strandings coincident with acoustic events reveals an obvious flaw in the process. A cursory glance at the funding sources behind the scientists on whose work the criteria are based shows why - every one has either worked for, presently receives, or has received funding from either the US military or the oil and gas industry. Industry involvement in the crafting of government regulations meant to control them defines corruption, a point we have pointed out on numerous occasions and most recently in a letter to the members of the Acoustic Committee on which NMFS is represented, and that incidentally, has yet to report to Congress on its findings.

The legitimacy of the process
 Included as part of these comments are the legal basis behind both Environmental Impact Statements (EIS) under the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) (NEPA), and the MMPA. The Notice does not comply with NEPA because it restricts the breadth of the discussion. The whole purpose of an EIS is to look at all information, not just that most palatable to the industries being regulated. According to the Code of Federal Regulations (40CFR1502), the purpose of an EIS is to "insure that the policies and goals defined in the Act [NEPA] are infused into the ongoing programs and actions of the Federal Government. It shall provide full and fair discussion of significant environmental impacts... and the reasonable alternatives which would avoid or minimize adverse impacts..."

The way that this EIS and the alternatives are presented is designed to prejudice the outcome, as does the grossly inappropriate influence on the Noise Group upon whose 'science' these choices are based. The NMFS permitting process has become compromised by the powerful industries it is supposed to regulate. This problem was recognized when the MMPA was originally conceived:

"Recent history indicates that man's impact upon marine mammals has ranged from what might be termed benign neglect to virtual genocide. These animal, including whales, porpoises, seals, sea otters, polar bears, manatees and others, have only rarely benefited from our interest; they have been shot, blown up, clubbed to death, run down by boats, poisoned, and exposed to a multitude of other indignities, all in the interest of profit or recreation, with little or no consideration of the potential impact of these activities on the animal populations involved." (US Congress Merchant Marine and Fisheries Committee Report 1971b: 11-12.)

That which was agreed to in the MMPA was a law that would ensure that "future generations will be able to enjoy a world populated by all species of marine mammals." (US Senate 1972a.)

This lofty promise was guaranteed in the law by two built-in elemental and innovative legal features to govern future decisions: 1) building a conservative bias in favor of the species and 2) assigning the burden of proof to the party seeking to take or import the species.

The courts have upheld this conservative bias. In *Committee for Humane Legislation, Inc. v. Richardson*, 414 F.Supp. 297 (D.D.C.1976), *aff'd*, 540 F.2d 1141, Judge Charles Richey held that the Act should be interpreted, "for the benefit of the protected species rather than for the benefit of commercial exploitation." Then, in *Kochechik Fishermen's Association v. Secretary of Commerce*, 839 F.2d 795, the District of Columbia Circuit Court of Appeals held that, when balancing commercial and conservation interests under the Act, "the interest in maintaining healthy populations of marine mammals comes first."

As originally written and intended, the MMPA held as one of its basic precepts that any party wishing to exploit marine mammals should have the burden of proof that such activity will be consistent with the Act's overall goals and not disadvantage any species: "If that burden is not carried-and it is by no means a light burden-the permit may not be issued. The effect of this set of requirements is to insist that the management of the animal populations be carried out with the interests of the animals as the prime consideration." (US Congress Merchant Marine and Fisheries Committee Report 1971b: 18).

Now we come to this NMFS proposal to prepare an EIS which sets new criteria on thresholds at which sound might result in impacts to a marine mammal such that a take by harassment might occur. In every way the intention of the MMPA as discussed above is not being carried out and in fact has been reversed in this process. First, the administrative bias is strongly towards allowing the increased impact on marine mammals from the use of anthropogenic sound. In case of a question of data, deference is clearly made to the applicant wishing to use the sound. Second, the burden of proof has been shifted onto the creature, and their defenders, and away from the party wishing to use noise, to prove that the use is damaging. Presently, industries using sonar and seismic instruments do not have to prove their safety, just assert unproven mitigations and continue as usual.

The scientific validity of the data
 The focus of the proposed EIS has been bizarrely attenuated, apparently in an attempt to ignore the plethora of data showing that anthropogenic noise does indeed harm living systems. The restriction of discussion to that related to Permanent Threshold Shift (PTS) and Temporary Threshold Shift (TTS) is blithely justified in the Notice by "providing a more scientific basis for defining the threshold levels." For over five years now and throughout the intensely controversial EIS process for Low Frequency Active sonar, representatives of the Office of Navy Research and the NMFS have been deceiving administrative and public attention by focusing almost exclusively on PTS and TTS. This orientation argues that the only effects of sound we have to be concerned with are those that cause physical damage to the ears of marine mammals. Real world events have not cooperated in supporting this particular argument and almost all of the new information about these events that has come to light, mainly through the Acoustic Committee, has been scrupulously ignored. Why?

Ignored is the elaborate modeling done by Dr. John Hildebrand, Dr. Peter Tyack and Dr. Bob Gistiner concerning the Bahamas 2000 strandings and presented at the San Francisco meeting of

the Committee on July 27, 2004. Combining the likely routes and intensities of active sonar devices moving through the area, and the likely movements of whales, they gave 138dB as the median level of sound that struck the whales who stranded and died.

We have learned that in some stranding incidents coincident with noise events, such as in the Azores (2002) and the Canaries (2002), whales have died with bubbles in their lungs and organs. It now appears from a series of studies and workshop presentations that there exists a mechanism of death quite different than that requiring levels of sound loud enough to physically injure hearing organs. It is the ability of sound to panic whales who, upon perceiving the onset of a sound louder than ambient, rise quickly to the surface from a deep dive and die from bubbles being created in their blood; a condition similar to the "bends". Thus we see a behavioral response that at relatively low levels of anthropogenic sound can lead to death. This phenomenon does not appear to be restricted to beaked whales as had been previously thought, for now there are indications that sperm whales may also suffer from this condition given the right circumstances.

The formulation of this EIS ignores all of this, or so we can infer from the list of Alternatives proposed in the Notice. The EIS process is not being adhered to as the law mandates. It is not prefaced with a "full and fair" discussion for the process but is constrained to just those aspects of the discussions which have elements that can argue for higher levels of sound to be allowed. In fact, just about the entire logic of the PTS and TTS criteria is based on highly abusive studies by the Naval Ocean Systems Center, San Diego that involved the deliberate infliction of intense levels of sound on captive dolphins and belugas. The paucity of sample size and the irrelevance of the study provide neither informed science nor guidance for setting criteria. It would be impossible to measure a startle response at far lower levels of sound with this type of experiment.

Similarly, there are limits to how far data can be extrapolated. Over and over, from the Low Frequency Sound and Marine Mammals Committee in 1994, through the HESS panel, and up to the current deliberations of the Acoustic Committee, the paucity of data from which critical decisions are being made has to be doric. It appears from the Notice that the NMFS, while acknowledging the extreme lack of available data, has decided to proceed anyway, and to extrapolate from that inadequate data to all creatures in question, including using data from experiments on terrestrial animals to fill in the gaps.

The legitimacy of the NMFS Noise Criteria Group
The use of criteria proposed by the Noise Group, even in the guise of "just providing information", is questionable because the legitimacy of the Noise Group is also questionable. In all respects it represents an "advisory committee" as defined in Federal Advisory Committee Act (Pub. L. 92-463, Sec. 1, Oct. 6, 1972, 86 Stat. 770) as "any committee, board, commission, council, conference, panel, task force or similar group, or any subcommittee or other subgroup thereof, which is (C) established or utilized by one or more agencies." The Noise Group must therefore follow the rules as laid down by that Act, Section 2 of which specifically states that "the Congress and the public should be kept informed with respect to the number, purpose, membership, activities, and cost of advisory committees." The Noise Group has met none of these requirements and their offerings therefore cannot legitimately be used in any way in the formation of policy.

Similarly, adherence to the US government's own guidance documents appears to be currently lacking with respect to the Noise Group and should be incorporated as part of the EIS process. For example, the Office of Management and Budget's "Final Information Quality Bulletin for Peer Review" of December 2004 that comes into force in June 2005, calls for the use of peer review by "qualified specialists" prior to the dissemination of "important scientific information" by the federal government. Further, the Bulletin calls for a transparent process and specifically calls out expertise, balance, independence and conflict of interest as important issues to address when selecting reviewers.

The timing of the Notice
Why is the issue of changing the noise criteria being raised now, when the Acoustic Committee is still in the process of deliberating exactly the ways intense sounds affect marine mammals. Unlike the Noise Group, the Acoustic Committee is a broad based group of stakeholders brought together by Congress to do this job. The criteria thresholds in question will likely constitute the most essential part of their recommendations, but instead of leaving it to their deliberations they are being pre-empted. Why?

In preparation of the EIS, NEPA requires the NMFS to "consider all types of impact both direct and indirect." We would request that the EIS include thorough discussion on the following issues:

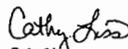
- The direct physical impact on each type of creature from each type of sound;
- How many additional times one organism is hit by the reverberation of each pulse of sound between surface and sea floor;
- The effect of multiple sound events, over hours, days, and weeks;
- The cumulative effect of multiple sources of sound, especially when both seismic and sonar are employed;
- The depth and size of creature that would be affected by resonance at different levels of sound frequency;
- The effect of long-term chronic exposure to each type and intensity of sound;
- The effect of masking in altering feeding and reproductive behavior;
- The effect of sound on the social behavior of each type of creature;
- The effect of each type of sound on prey species;
- The effect of long term chronic exposure of each type of sound to prey species, including plankton;
- The conditions under which bubbles are generated in cetacean and pinniped blood;

- The synergy between the effects on different species;
- All of the above at different sea states, at different depths, in different temperature zones, under differing bathymetric conditions;
- How the measurement of the same received sound in air differs to that measured in water;
- The applicability and use of the results of studies of the chronic effects of sound on human beings, including relatively low levels of sound;
- All the data extrapolation and "tuning", including the reasoning to explain how the largely visual terrestrial creatures can be used in the place of ocean creatures, who are primarily sonic and therefore more sensitive to sound;
- The term "science-based", in regard to the decisions on what data to use and what to dismiss;
- The socio-economic effects of the whale and dolphin watching industries;
- The relevance of documented global marine mammal stranding incidents that have occurred coincident to anthropogenic noise events;
- The applicability of the strong cautionary statements regarding anthropogenic ocean noise made by various international governments and bodies, including: the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (2003); the International Whaling Commission (July 2004); the European Parliament (October 2004); the government of Spain in regard to the Canary Islands (October 2004); the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (November 2004); and the World Conservation Union (November 2004); and
- The current mitigation methods used in the permitting process, including an analysis of all known critiques on the effectiveness of these methods.

Given the extreme problems connected with this document, including the narrowing of the scope and basing the criteria on the information derived from a panel of questionable legitimacy, the Animal Welfare Institute requests that you reconsider the decision to prepare an EIS as outlined in the Notice and develop alternatives that truly address the best available knowledge. We also recommend that the process be suspended until the Advisory Committee has concluded its meetings, furnished its report and had the report's findings and recommendations accepted.

Finally, we would like to remind NMFS that per NEPA, "Environmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made."

Sincerely,


Cathy Lisa
President

From
Date: Sunday, March 13, 2005 9:57 pm
To: AcousticEIS.Comments@noaa.gov
Subject: Noise Exposure Criteria: CSI comments
Attachments: [nmfsNoiseCritCSI305.doc](#)

Please see attached document.

Thank you,
Willem W. Rossiter
President
Cetacean Society International

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BY FAX AND EMAIL ATTACHED FILE

14 March 2005

William W. Rossiter
President, Cetacean Society International

P. Michael Payne
Chief, Marine Mammal Conservation Division
Office of Protected Resources, NMFS (F/PPR)
1315 East-West Highway
Silver Spring, MD 20910
Acous@cis.comments@noaa.gov
Fax 301-427-2581

Re: LD, 060804F

Dear Mr. Payne:

Thank you for this opportunity for Cetacean Society International (CSI) to submit comments on the scope of the proposed National Marine Fisheries Service (NMFS) Noise Exposure Criteria Environmental Impact Statement (EIS). Thank you as well for the diligent effort to hold public scoping meetings across the US, and address public questions prior to the closure of the scoping process. CSI's comments are meant to be constructive, and to focus on aspects that we urge the process to address in the draft phase, primarily to minimize challenges and delays to the DEIS. We hope the end product will be an effective solution for issues between marine mammal and anthropogenic noise.

It may be helpful to begin with an acknowledgement that anthropogenic marine noise is a controversial subject, with growing economic, political and military influence seen as pitted against the welfare of marine mammals. The MMPA has been under increasing attack, the number of noise polluters is constantly increasing, and the tendency has been for major noise-makers to be excused from compliance rather than mitigate their noise. This EIS is viewed by some as the latest phase of this attack, an effort to increase allowable anthropogenic noise and decrease regulatory actions and oversight. Building on the history of the ATOC, LFA, LWAD, ship shock trials, pile driving, and seismic surveys, this EIS process has inherited a credibility gap. It appears to some to be aimed at allowing the oceans to be noisier, without credible evidence to support that outcome, and make it more difficult for NMFS to fulfil its duty under the MMPA.

The credibility of the Noise Exposure Criteria Group (NEC), conveyed by NMFS to provide guidance and expertise to create "allowable" exposure criteria, has been questioned by CSI and many others. Repeated efforts seeking transparency from the NEC have been ignored. Whether or not NMFS chooses to use any of the NEC findings, the assumption that a bias exists in the panel should be addressed with candid disclosure, not denial and avoidance.

The assumption of bias in the process derives from the NEC's composition, with some professionals who, in general, do not reflect the legally required balance of an advisory committee, may have potential conflicts of interest with funding sources and employment, and may not have demonstrated sufficient precautionary concerns about the issues at stake. The NEC also lacks transparency with panel procedures, discussions and findings. Other NGOs have provided specific concerns regarding the requirements of the Federal Advisory Committee Act (FACA) as it applies to the NEC, but we prefer a

non-legal approach based on logic and communication; Please step back and consider your options for addressing these concerns, rather than dismissing them.

The NEC's makeup is almost unavoidable; we assume that NMFS sought the best advice possible, and did not attempt to "stack the deck" in creating the NEC, but it is obvious that GNR and industry funding have been the primary sources for most marine mammal noise work for more than a decade. It is difficult to find professionals without the appearance of a conflict of interest, so it should not be taken as a slight on anyone's professional integrity to recognize that it is the appearance of impropriety that needs to be addressed. Therefore, please comply with the many requests for information of NEC members, but emphasize the professionals who were asked to participate that have no such funding complications, whether they chose to participate or not.

Of greater concern is the transparency of the NEC process. The issue's controversy will just be ramped up with any appearance of secrecy, especially given that everyone concerned is working from the "best available science", which should be open to public review. The intent of the NEC to produce a peer-reviewed paper for submission to JASA should not delay implementation of their work as a public resource, but making their product proprietary only serves to increase the controversy from secrecy.

The credibility issue with this EIS process may begin with the belief that outside pressures are forcing a premature product. Will it be of value to make an extra effort for transparency and disclosure? Most of all, will the process reflect clear protocols for precautionary principles? For example, Alternatives above it would more than double allowable noise. This does not seem to be a defensible precautionary approach in the face of ignorance. We have learned that the Criteria values for A and B in the different Alternatives are not locked in place, but may be mixed and matched as the DEIS develops. Unfortunately, we suspect from all that we have learned that Alternative V is heavily favored even at this early stage. Overall the matrix is not off to a good start in terms of credibility.

So far the only materials available for public review are various brief statements from the Federal Register announcements, Marine Mammal Commission Noise Meetings, and NMFS scoping meetings. None do more than lip service to a precautionary approach. CSI notes that, in an earlier presentation, the 2001 NRC Definition of the precautionary principle was used, ostensibly as a guideline: "If the burden of proof were to show that an action would not harm a species rather than that it would harm a species, increased protection would result. The importance of shifting the burden of proof this way ... is known as the 'precautionary principle.'" We note that considerable worldwide attention has been given to definitions and discussions of the precautionary principle, most recently with a scientific workshop in Ecuador. CSI requests that NMFS review the precautionary principle as defined beyond the NRC. Far more importantly, CSI requests that NMFS clarify whether the agency's policy is that the burden of proof is on the noise-maker to show no harm, or on the reviewer to show harm.

CSI has used the definition of Biological Significance (without abbreviation) as defined by the National Research Council's 2005 "Marine Mammal Populations and Ocean Noise", as NMFS may have adopted this definition. Overall, the 2005 NRC recommendations are unrealistic, as the time and funding to complete them are not available. The recommendation for stress tests to determine impacts deserves consideration, although CSI is not implying support for the methodology.

The emphasis in the scoping process to date is for regulatory thresholds based on TTS and PTS onset, almost as a premature conclusion. However, it is logical to assume that initial acoustic impacts will be behavioral, that many animals will modify their biologically significant behavior if subjected to a noise lower than that which would induce TTS. The public announcement describing the EIS process asserts that "guidelines (will be based) on exposure characteristics that are derived from empirical data and are tailored to particular species groups and sound types." But anyone with a clear view of current knowledge will have difficulty with the assertion that guidelines will be "derived from empirical data." There simply is not enough empirical data to go on. For example, a handful of audiograms are available for perhaps 10 species of odontocetes and 11 species of pinnipeds, most from non-representative prime-age captive animals. Only 20% of the 118 marine mammal species, and no baleen whales at all. Where multiple studies of one species exist the data points reflect natural variations, not one size fits all as implied in the

resulting matrix. The limited data set of audiograms is interpreted in the matrix as if marine mammals did not have individual variability, from age, disease, injury, and other reasons.

CSI supports the matrix approach, and agrees that the generic 180/160/120 values may be too simplistic, but we cannot understand how professional scientists can accept the presented matrix as reality based. It is essentially equal to the one publicly presented in April 2004, suggesting no influx of data and a fixed conclusion. If the process is not adapting to new information, or supporting and seeking better facts, why should the public not conclude that the DEIS conclusions are unofficially set?

The matrix criteria categorize all anthropogenic sounds into single pulses, single non-pulses, multiple pulses in a series, and multiple non-pulses in a series. Where do seismic surveys fit? Recent experience with the R/V Ewing in the Gulf of Mexico demonstrated that, to a marine mammal, the noise of the full array is perceived as a constant din for so many hours that the matrix criteria seem meaningless. The animals may have many reasons for not leaving the zone, but the simplest is that they may not know which way to go to escape. The cumulative effect of affectively constant noise over very long periods must be addressed based on perceived reality, not the frequency of pulses per array over time. Cumulative noise damage is of personal concern to me: my 40 year flying career has resulted in five distinct and consistent sounds that make a wide range of frequencies. I am convinced that many anthropogenic sources are causing similar effects, but I am more convinced that most experts would be more precautionary if they had to hear what I hear when surrounded by silence.

Audiogram results plus assumed values are used to define TTS and PTS onset. They have little value defining onset of significant biological behavioral response, which is where the noise problem begins in many cases. More than 80% of the species of concern for sound impacts have no direct behavioral hearing data, or the data rests in ignored non-peer-reviewed, often anecdotal reports.

Discussions of individual variability are not reflected in the matrix, where the fundamental assumption is that minimal data on TTS and PTS onset studies of a handful of prime-age, healthy, disciplined, captive marine mammals accommodated to experimentation, can be logically extrapolated to all marine mammals under all conditions. Yet a comparison of TTS studies finds up to 60dB range between individual sensitivity. Consider for a moment the problems of representing human TTS and PTS onset from tests using only military personnel. But even that would be more acceptable than inferring thresholds of baleen whales from a few highly conditioned captive dolphins.

The FR Notice for the noise exposure criteria states that some terrestrial mammal data is used, including human data. This may be a significant change from previous agency opinion, which will be explored later by many; the DEIS can expect comments relating to earlier statements arguing for the exclusion of human data, for example the US Navy 145dB exposure rate. The implication is for mixing apples and oranges, depending upon the conclusion desired. For the LFA it was necessary to ignore values as low as 145 dB for potential marine mammal impacts, as the geographical area affected would have been enormous. Now allowing human data may serve a different purpose.

These are some reasons why CSI considers this DEIS process premature and forced. The pressures to allow more human noise rather than less are enormous and growing but, even in the face of that reality, we believe that the mandated responsibility of NMFS is better served by backing up the MMPA and stimulating needed research, rather than producing a DEIS that may lack credibility because it stretches the facts to accommodate the pressures. Underlying the process to date is the stated interest of NMFS to reduce the permitting workload and overall costs. This approach has reduced many other NMFS actions to mere shells, and must be disconcerting to the professionals involved. CSI recognizes some of the significant threats NMFS faces, including links between IWC votes and the NMFS budget. The pressures from Above may be enormous, but can NMFS produce a credible and defensible EIS with the data available?

We understand that the NEC intends to submit the matrix and discussion to JASA, for publication as a peer-reviewed paper. To be blunt, it is unlikely that any matrix derived from such minimal data would be accepted as the core of a PhD dissertation. The planned JASA paper may be appropriate as a theoretical

paper, or discussion meant to stimulate better science, but it should not be construed as a working matrix for definitive management applications.

Alternative II's takes "would occur at the SPL at which the most sensitive species first begin to show a behavioral response" (for example, a harbor seal rather than an elephant seal), with Level A harassment when a human source "exceeded the highest average ambient noise level in the area of operation." This appears confusing and not well linked. Activity may be permitted that simply adds loud noise to an already high ambient level. When is the breaking point for the animals involved? The seemingly arbitrary Level B harassment, when "noise from a human source exceeded the lowest possible ambient noise condition", also simply does not make sense. How would this be measured and enforced? The appearance is of an Alternative intentionally flawed so as to be unacceptable.

There appears to be a significant gap between Alternatives II and III. Alternative II's Level A jumps to TTS onset, an extremely extrapolated value that cannot be accepted as anything but a crude estimate for most affected animals. Logically, there should be some intermediate value, a value that CSI believes should be based on behavior.

Perhaps what needs to be quantified at this point is the characteristic of meaningful noise, allowing for a sound that may be perceived as a learned threat, such as gray whales hearing a screeching chain or distant orcas. Noise represents objects and situations to animals, not power levels. Given the reality of human predation on Latin America's transistanscaia it appears that the sound of any approaching boat elicits avoidance. When was the last time you saw a photo of a live transistanscaia in the wild? In that context a specific noise well below TTS onset, and perhaps even below ambient, may induce biologically significant behavior; one boat could deny habitat to an entire population. Marine mammals are assumed to have evolved capacities to detect significant sounds below ambient, so the key is the significance of the sounds to the animals. That can be estimated for many species from hundreds of reports and peer reviewed papers. Yes, the matrix could become even more cumbersome with more variables included, but meaningful noise characteristics should be considered, as many sounds would not be heard as possible threats, and their allowable levels could be increased.

A specific example of meaningful noise is Howeek, Johnson and Tyack's "North Atlantic right whales (Eubalaena glacialis) ignore ships but respond to alerting stimuli". Five out of six whales responded to an alerting stimulus at received levels of only 133-148 dB, by stopping their foraging and swimming towards the surface. The disruption was temporary but significant, as the energetic needs of right whales may not be met during lean years because of patchy prey distribution, with a demonstrated impact on population recruitment. What if, to the whales, the alert stimulus was similar to something natural to which they feel compelled to respond, or what if right whales often respond this way to most novel stimuli? It is possible the cumulative disruptions may reach biological significance? If any of these novel stimuli are anthropogenic they must be included in all the other massive efforts to constrain human activities to save this population. The matrix must take such examples into account.

Reinforcing the significance of behavioral reactions, Tyack has also written: "some ecoustic activities may impact enough of a species' habitat to raise concerns that animals may not be able to use the habitat as effectively. A 25% reduction in feeding or interference with communication used in the mating system could have a much larger effect on a population than a few accidents where animals come so close to sources that their hearing is affected." Again the transistanscaia come to mind, as examples where meaningful noise may produce reactions that deny habitat at SPLs far below TTS onset, and even at or below ambient.

The DEIS discussion of the "Behavioral Disturbance Criteria 24-hour Rule" would benefit from a thorough description of intent and scenarios well beyond what has publicly been provided. The trailing caveat, "the disturbance would not be considered biologically significant unless there is specific contrary evidence," is not very clear, as there seem to be many scenarios where a habitat denied for less than 24 hours as a result of noise would still be biologically significant.

How are reactions to meaningful sounds to be documented? CSI believes that controlled exposure experiments (CEE) offer considerable potential for documenting subtle behavioral responses to noise that may be biologically significant, yet far below TTS. Perhaps more important, there may be no better way to add data to raise the matrix assumptions into scientifically credible values. However, CEE's should never cause adverse impact, and CSI cannot support many CEE projects that we know of out of concern for animal welfare. While we are disgusted with the logical and unethical efforts to derive TTS from dying, stranded beaked whales, and do not support invasive tagging, we support with enthusiasm the CEE studies of right whale ship alerts with suction cup tagging. CSI also supported the IFA SRP project to sonify gray whales during migration, because the methodology was particularly sensitive to the whales' welfare. That research demonstrated 50% aversion from the inshore source at 130dB, and can be used as a sample of context dependent results. Many studies of harbor porpoise and pingers demonstrate both aversion and accommodation (habitation), but we are not convinced that NMFS is using the latest information from EU research.

CEE's are deservedly controversial, because subjecting marine mammals to noise intended to alter behavior skirts ethical guidelines, guarantees media attention and NGO probes, may result in lawsuits, and may be difficult to fund as a result. Beyond these complications, CEE's are not common because of the gratifying reluctance of most scientists to subject marine mammals to disruption and injury. But what about making studies that use anthropogenic noise events that may cause disruptions anyway? Why are these opportunities missed? Certainly there is a control problem, and few projects want to be dependent upon a time schedule forced on them, but the opportunities exist, and are missed constantly. For example, the Navy has refused CSI's request to let even security-cleared scientists when and where operations would be conducted, in part so that qualified necropsy teams could be on standby to make the best use of any strandings. Another reason would be to initiate a concurrent CEE project documenting cetacean distribution before, during and after the event, and the noise field generated near the catcecons by the event. Although publically stating their support for noise solutions, and with full control over security issues, the Navy is preventing access to research opportunities to provide such solutions.

The DEIS also should call for increased acoustical impact funding by the National Science Foundation.

Beaked whales appear to be omitted from the publically available matrix, but we understand that the matrix may have some sort of necessary category for beaked whales, and look forward to seeing the specifics. The DEIS must declare that significant harm may come to beaked whales from human noise, even if none are found dead or dying near an event. Only one percent of the beaked whales in an environment will be detected by the best experts, and they may be everywhere specific environmental conditions exist; a very sizable portion of the ocean. Mitigating harm to beaked whales should be a focus of the matrix.

Beaked whales have demonstrated their behavioral responses to low levels of specific sounds by altering their surfacing behavior, which put some of them at risk of grievous injury and death. Specific sounds from naval operations and seismic exploration activities appear to be the cues, and sophisticated modeling of the 2000 Bahamas event by Balcomb and Hildebrand suggested a mean level of exposure to noise in the range of 130-140 dB. The few mass stranded beaked whales properly studied have offered conclusive proof that many died of physiological effects brought on by behavioral responses that unintentionally placed them at risk. A paper summarizing beaked whale mass strandings and some concurrent naval operations will be given at the 2005 European Cetacean Society (ECS) meeting, and the findings are startling and significant. Suction-cup tagging has been proven for beaked whales. Why not tag beaked whales in an area where a significant noise event will take place? That concept was used successfully for sperm whales during seismic surveys. How many beaked whales have been lost at sea or survived crippled since the vast majority of mass strandings began in the early 60's is unknown, but the link has been proven, something should be done about it, and this DEIS is the place to start.

It is clear that most observations of behavioral reactions to noise are inadequate. Reports abound of apparent lack of behavioral responses to significant noise, such as finbacks passing by calving glaciers, or sperm whales continuing to forage while enveloped by seismic survey sounds. These events are assumed to demonstrate that there was no biologically significant reaction, but it is more factual to admit

that the observations were unable to define one. That a response is too subtle for current analytical abilities does not mean that the response was not biologically significant, particularly long term. Again, tagging to determine responses to perceived noises may help to fill the gaps.

Species living in strong social units, such as pilot, melon-headed, false killer and killer whales, have been documented in situations suggesting extreme aversion to sonars, such as the Shou's transit of Haro Strait, strandings in Taiwan, or unusual shattering in a bay in Hawaii. The DEIS must accept these types of events as deserving of attention, rather than dismissing them as purely anecdotal or not sufficiently controlled. Many very social species may react or not react to stimuli because of the actions of the leaders. If the leader is extremely impacted by a specific sound and blunders ashore, it is possible for the behavioral change in one individual to cause a biologically significant result as the whole group is lost.

With reference to the resources listed on the NMFS website, CSI urges consideration of the IWC SC56/Annex K Report of the Standing Working Group on Environmental Concerns, which we could not find listed. Also of value are a seminal discussion paper by William Evans, and several international papers, such as the relationship between seismic surveys and species diversity in Brazil. We especially recommend several papers that should become available from the 2005 meeting of the ECS. Studies and data relating to anthropogenic marine noise are becoming available all the time. If it is acceptable to construct a complex matrix to represent entire genera based on a very small sample of selected individuals, then it is equally acceptable to admit evidence and potentials from the non-peer-reviewed reports of behavioral impacts that are everywhere. If a handful of TTS and PTS studies can be magnified to relate to all marine mammals, it is logical to include non-peer-reviewed observations of behavioral responses of marine mammals to loud underwater noises. Much work on fishes has demonstrated that swim bladder damage results from seismic surveys, and that it is more pervasive, and occurs at lower sound levels and in shorter exposure durations, than previously suspected. In a Norwegian study conducted in the central Barents Sea, seismic shooting severely affected fish distribution, local abundance, and catch rates over a large geographic area.

The DEIS process must be set up to seek out and incorporate this flow of information in an aggressive, continual and transparent manner. It must be recognized that the entire process may be altered by some significant data becoming available at the last moment; there can be no cut-off date until the document is sent to the printer. Besides being an expansion of available sources, a forthright worldwide search effort will dilute criticisms of potential bias among US sources from funding entities. Every bit of information considered by the DEIS process also must be available for timely public analysis. As a backup, it is possible that a significant resource may be known to a commenter, but not known to the DEIS preparers.

As one example of the latest information, CSI requests that the Report of the Subcommittee on Synthesis of Current Knowledge, Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals, be included in the DEIS process and available for public review early in the DEIS comment process. Both the MMC and NMFS should cooperate towards that goal. The Subcommittee's stated purpose is to provide the best and most current resource. It is not enough to assume that normal delays will allow this resource to be available to the public in time; it must be assured. NMFS must work with the MMC Advisory Committee to guarantee this.

Thank you for the opportunity to comment during the DEIS scoping process.

Sincerely,

William W. Rossiter
President

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From "Mathew Dunn"
Date: Monday, March 14, 2005 12:23 pm
To: <AcousticEIS.Comments@noaa.gov>
Subject: ID 060804F: Public Comment on NOI to Prepare an EIS on Noise and Marine Mammals

Attachments: NMMA Comments Re NMFS Notice of Public Scoping and Intent to Prepare an EIS on Noise and Marine Mammals 104K

Dear Mr. Payne:

Please see NMMA's attached comments to the National Marine Fisheries Service regarding its Notice of Public Scoping and Intent to Prepare an Environmental Impact Statement on New Criteria for Sound Exposure Threshold Guidelines for Marine Mammals under the Marine Mammal Protection Act and Endangered Species Act. Please let me know if you have any problems downloading this file. I will also be faxing you a copy of these comments.

Best regards,

Mathew P. Dunn
Research Analyst, Government Relations
National Marine Manufacturers Association



March 14, 2005

P. Michael Payne
Chief, Marine Mammal Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910

VIA FACSIMILE [301-427-2581] & EMAIL [AcousticEIS.Comments@noaa.gov]

RE: Public Comment on Notice of Public Scoping and Intent to Prepare an Environmental Impact Statement on New Criteria for Sound Exposure Threshold Guidelines for Marine Mammals under the Marine Mammal Protection Act and Endangered Species Act

Dear Mr. Payne:

The National Marine Manufacturers Association (NMMA) appreciates the opportunity to present the National Marine Fisheries Service (NMFS) with the following comments in response to the Agency's Notice of Public Scoping and Intent to prepare an Environmental Impact Statement (EIS). The EIS is being undertaken to assess the potential impacts of applying new criteria in guidelines to determine what constitutes a "take" of a marine mammal under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) as a result of exposure to anthropogenic noise in the marine environment.¹

NMMA is the nation's largest recreational marine industry association, representing more than 1,500 boat builders, engine manufacturers, and marine accessory manufacturers. NMMA is also submitting these comments in conjunction with the Personal Watercraft Industry Association (PWIA), an NMMA affiliate that represents personal watercraft (PWC) manufacturers. NMMA members collectively produce more than 80 percent of all recreational marine products made in the United States, including boats, engines, and marine accessories and components. With 13 million registered boats and almost 72 million boats nationwide, the recreational boating industry contributes \$30 billion and 400,000 jobs annually to our nation's economy.

The National Marine Manufacturers Association and its membership are steadfastly committed to sound environmental stewardship. The association and its membership appreciate the need to protect important wildlife, particularly marine mammals. Nevertheless, NMMA has some concerns and questions regarding the available science upon which new sound exposure criteria will be based.

¹ 70 Fed. Reg. 18716 (Jan. 11, 2005).

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In general, NMMA supports efforts to utilize sound science and to apply new research and information to federal resource protection and management efforts. In concept, NMMA does not oppose the National Oceanic and Atmospheric Administration's (NOAA) desire to establish new "science-based guidelines" for determining an acoustic take under MMPA. We are deeply concerned, however, that the current action may be premature. There are significant data and knowledge gaps in existing research, which NOAA openly acknowledges in its Notice of Intent. NMMA has conducted a comprehensive review of the scientific literature on the auditory thresholds of marine mammals and consulted with acoustic experts. We have found that there is consensus in the scientific and regulatory community that acoustic research on marine mammals is incomplete at this time. The National Research Council (NRC), following a comprehensive review of available science in this area, summarized this point quite lucidly: "existing data are insufficient to predict accurately any but the greatest acoustic impacts on marine mammals."² Therefore, NMMA strongly recommends that NOAA continue studying this issue, but refrain at this time from developing any guidelines based on woefully inadequate data.

NMMA is pleased to present its perspective on this matter, and our comments will focus largely on the following: (1) determining the true impact of this current effort on the recreational boating community poses significant challenges due to shortfalls in information provided by the Agency in its Notice of Intent and at its scoping meetings; (2) the existing base of research on marine mammal hearing, auditory threshold levels, biologically significant disturbance, and noise levels from various sources suffers from numerous—and substantial—knowledge gaps, which hinders the current effort to establish new sound exposure criteria to such a degree that the effort should be postponed; (3) several of the alternatives presented are, in our judgment, untenable as management options and should not be pursued.

I. The Impact of the Proposal is Impossible to Determine

The National Marine Fisheries Service is asking stakeholders and constituent groups to provide comment on its current effort to establish "science-based thresholds to improve and replace the current generic exposure level thresholds that have been used since 1997."³ NMMA appreciates the opportunity to provide comment, although our ability to do so is constrained by an incomplete set of information supplied by NMFS.

Specific Sound Threshold Levels for All Marine Mammals Are Necessary

In its Notice of Intent, NMFS indicates its desire to establish a new set of criteria based on varying levels of TTS and PTS onset, and, in Alternative III, behavioral avoidance. The Agency provides an example by way of the Gray Whale, for which it specifically applies its proposed noise exposure criteria based on the limited auditory information available. NMMA and other stakeholders will be unable to provide meaningful comment on the appropriate scope of an EIS and to assess whether new criteria would impact our interests unless NMFS provides a similar

² Committee on Potential Impacts of Ambient Noise in the Ocean on Marine Mammals, Ocean Studies Board, National Research Council, *Ocean Noise and Marine Mammals* (National Academies Press, 2003) at 36.
³ 70 Fed. Reg. at 1872.

chart outlining the sound exposure thresholds for each mammal species in the five functional hearing groups for which these guidelines are to be used. Since some limited direct TTS studies have actually been conducted with bottlenose dolphins⁴ and a beluga whale,⁵ one individual harbor seal,⁶ one individual northern elephant seal and California sea lions subjects,⁷ the Agency should demonstrate the proposed application for mid- and high-frequency cetaceans as well as underwater and above water pinnipeds as it has extrapolated for the Gray Whale. We realize this would be a significant undertaking, but we feel it would substantially aid the ability of stakeholders to comment in a meaningful way. The National Environmental Policy Act scoping process is intended to make impact statements more relevant by clarifying the issues to be discussed in an Environmental Impact Statement. In our view, the Agency has not properly identified the proposed agency action, making it impossible for the public to assist the agency by identifying its concerns. Until the Agency is able to provide specific sound exposure levels for all classes of marine mammals and for all alternatives, this scoping process and any Draft Environmental Impact Statement prepared subsequently will be deficient.

In addition, the EIS must fully consider the impacts of NOAA's proposed actions on the human environment, which is impossible unless and until NOAA provides specific sound exposure levels for all classes of marine mammals in the five functional hearing groups.⁸ In particular, NOAA must study how these alternatives will impact human activities, including socioeconomic impacts. NOAA guidelines and policies on NEPA define the human environment as including the "natural and physical environment and the relationship of people with that environment. . . when an EIS is prepared and economic or social and natural or physical environmental impacts are interrelated, the EIS must discuss all of these impacts on the quality of the human

⁴ Machignall, P. E., J. L. Pawloski, and W. W. L. Au. 2003. "Temporary threshold shifts and recovery following noise exposure in the Atlantic bottlenose dolphin (*Tursiops truncatus*)." *Journal of the Acoustical Society of America* 113, 3425-3429; Fineman, J. J., C. E. Schuett, R. Dear, D. A. Carter, and S. H. Ridgway. 2002. "Temporary shift in masked hearing thresholds in odontocetes after exposure to single underwater impulses from a seismic watergun." *Journal of the Acoustical Society of America* 111, 2939-2940.
⁵ Fineman, J. J., Schuett, C. E., Carter, D. A., Clark, J. A., Young, J. A., Gaspin, J. B., and Ridgway, S. H. 2000. "Auditory and behavioral responses of bottlenose dolphins (*Tursiops truncatus*) and a beluga whale (*Delphinapterus leucas*) to impulsive sounds resembling distant signatures of underwater explosions." *Journal of the Acoustical Society of America* 108, 417-431; Schuett, C. E., J. J. Fineman, D. A. Carter, and S. H. Ridgway. 2000. "Temporary shift in masked hearing thresholds of bottlenose dolphins and white whales after exposure to intense tones." *Journal of the Acoustical Society of America* 107, 3496-3508.
⁶ Kastak, D., and R. J. Schusterman. 1996. "Temporary threshold shift in a harbor seal." *Journal of the Acoustical Society of America* 100, 1903-1908; Machignall, P. E., J. L. Pawloski, and W. W. L. Au. 2003. "Temporary threshold shifts and recovery following noise exposure in the Atlantic bottlenose dolphin (*Tursiops truncatus*)." *Journal of the Acoustical Society of America* 113, 3425-3429.
⁷ Fineman, J. J., R. Dear, D. A. Carter, and S. H. Ridgway. 2000. "Auditory and behavioral responses of California sea lions (*Zalophus californianus*) to single underwater impulses from an air-gun transducer." *Journal of the Acoustical Society of America* 114, 1667-1677; Kastak, D., R. J. Schusterman, B. L. Southall, and C. J. Reichman. 1999. "Underwater temporary threshold shift induced by octave-band noise in three species of pinnipeds." *Journal of the Acoustical Society of America* 106, 1142-1148.
⁸ Environmental Review Procedures for Implementing the National Environmental Policy Act, NOAA Administrative Order Series 216-5 (May 20, 1999), § 3016 ("NOAA NEPA Procedures"). Pursuant to NOAA's policies on NEPA, the Agency must "fully consider the impacts of NOAA's proposed actions on the quality of the human environment." See also § 6.01.

environment.⁹ Central to the natural and human environment are recreational boaters and anglers. As such, a complete socioeconomic assessment is necessary in this case.

A socioeconomic evaluation in the development of an EIS on this issue is particularly important given the size of the recreational marine industry, which is more than twice the size of the cruise ship industry, larger than the commercial fishing industry and recreational saltwater angling, and in many years even outpaces the offshore oil and gas business.¹⁰ Nationally, our industry supplies more than 400,000 Americans with good paying jobs, providing nearly \$7 billion in wages every year.¹¹ Recreational boating also drives millions of Americans to the nation's coastal communities for recreation and tourism annually, contributing billions in spending and sustaining hundreds of thousands—if not millions—of related jobs for people who work in hotels, restaurants, marinas, gas stations, grocery stores, and other retail shops in those local economies. Recreation and tourism is one of the fastest growing sectors of the U.S. economy, and more and more Americans are choosing the nation's waterways as their preferred venue for relaxation and enjoyment.

In addition, saltwater recreational fishing, which is inextricably tied to boating, is a substantial economic force in the United States. The more than 13 million recreational saltwater anglers took approximately 82 million fishing trips in 2003, generating more than \$30 billion in economic impact and supporting nearly 350,000 jobs nationwide, something which has been acknowledged in NOAA's new Recreational Fisheries Strategic Plan, *A Vision for Marine Recreational Fisheries*.¹² Together, recreational boating and angling contribute more than \$60 billion a year to the nation's economy and provide nearly a million American jobs. Both constituent groups are uniquely affected by federal regulations related to the marine environment. As such, any EIS must fully assess the impacts of all proposed actions on these stakeholders specifically.

Proposed Rule or Draft Guidelines?

At the scoping hearings, attended by NMMA, the Agency failed to clarify the nature of the agency action, indicating that it was undetermined at the present time whether the sound exposure criteria would serve strictly as guidelines (as in the status quo) or if the new criteria would ultimately become a regulation through a full rulemaking process. Thus, we are unsure if the agency action under study is a proposed rule or draft guidelines. This lack of clarity is of

⁹ NOAA NEPA Procedures, § 4.011.
¹⁰ We note here that recreational watercraft are not a significant source of ocean noise. See discussion on p. 11-12 of these comments.
¹¹ National Marine Manufacturers Association (2004). These estimates are conservative. In California alone, for example, a recent economic impact assessment indicated that the 8,300 boating-related businesses in the state contribute approximately \$16.5 billion to the Gross State Product annually, \$1.6 billion in state and local taxes annually, and more than 284,000 jobs to the economy. Department of Boating and Waterways, California Resources Agency, California Boating Facilities Needs Assessment. Vol. 5. Boating Economic Assessment and Demand Projections (Oct. 15, 2002).
¹² U. S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, *A Vision for Marine Recreational Fisheries: NOAA Recreational Fisheries Strategic Plan*, FY2005-FY2010 (Dept. of Commerce, 2005).

considerable concern to NMMA and NMFS should indicate its intent with respect to the end use of these guidelines in order for NMMA and the public to fully assess the Agency's action.

NMFS Should Explain the Proposal's Impact on CZMA Plans

NMMA is also concerned about the impact of this rulemaking on states, which have authority under the Coastal Zone Management Act (CZMA) to regulate underwater noise levels from human sources. Some states, including California and Hawaii, have undertaken to regulate underwater noise.¹³ NMFS should consider and explain to the public how these new guidelines will impact existing state Coastal Zone Management Plans, for example. Such a review is required by NOAA's NEPA procedures and would be of interest to public stakeholder groups including NMMA.¹⁴

Sound Exposure "Guidelines" Should only be used on a Case-by-Case Basis

NMMA is pleased that NOAA has recognized the significance of its proposal to adopt new sound exposure threshold guidelines and decided to prepare an EIS. However, NMMA is particularly concerned about this agency action since it clearly will provide a precedent for future actions by NOAA, other federal agencies, and the states in managing marine noise. As such, it would be irresponsible for the Agency to take any "short cuts" by not fully explaining its proposal or by rubbering to take action before the science is ready. NOAA should assess the degree to which this action will establish a precedent for future actions.

If NOAA insists on pressing ahead with this proposal (either as a proposed rule or as draft guidelines), the Agency should indicate that it will be limited to use for the issuance of individual incidental take permits by NMFS on a case-by-case basis only, as is done in the status quo. Such an approach will be far more effective in terms of resource management and protection and far less onerous on the regulated community. To be accurate, any effort to assess the impact of noise on marine mammals must consider important contextual variables in specific marine environments, such as seafloor topography, ambient noise levels, water depth, and others. These new noise threshold guidelines should not be utilized for the development of blanket regulations on human activities, such as recreational boating and angling, and they should not be applied by federal agencies not in the business of issuing incidental take permits for marine mammals under the Marine Mammal Protection Act. NMMA cautions that the U.S. Fish and Wildlife Service (FWS), which manages manatees, polar bears, and sea otters under MMPA, should also not utilize these guidelines since NOAA is not developing in this agency action guidelines for these species. Such use is conceivable and is of great concern to NMMA and the millions of recreational boaters who enjoy our nation's public waterways each year. Recreational boating access, which underpins the viability of the entire boating industry, is a priority for NMMA. We are concerned that, without prior notice or scientific justification, these guidelines may be used by federal and state agencies other than NMFS to justify restrictions on

¹³ See, for example, Mark Delaplaine, Federal Consistency Supervisor, California Coastal Commission, "State Regulation of Underwater Noise" (Nov. 20, 2001), available at http://www.changefile.com/naaa/naaa011120_01.pdf; Accessed March 11, 2005.
¹⁴ NOAA NEPA Procedures, § 5.02c.3(c).

recreational boating access in federal and state marine protected areas. Such a general application of these guidelines would be inappropriate, scientifically unsound, and something that NMFS should be clear about as it proceeds.

II. The Science Is Underdeveloped and Incomplete

Even as interest in underwater acoustics and ocean noise has grown over the last several years, research has often failed to keep pace with demand. To be sure, researchers have made significant advances in data collection and have generally expanded our understanding of how some, though not nearly all, marine mammals hear and why sound is biologically important. But serious gaps in knowledge persist and considerable research remains to be done before any regulatory effort which strives to be "science-based" can occur. Clearly, responsible management must concern itself with locating a balance between the risks posed by overregulation and those posed by underregulation—in the case of marine mammals and ocean noise, the extent of scientific uncertainty should give considerable pause to federal resource managers as they move forward with any attempt to significantly modify status quo guidelines and regulations.

NMMA is not alone in concluding that scientific uncertainty in this field is substantial. A 2003 study, *Ocean Noise and Marine Mammals*, by the Ocean Studies Board of the National Research Council (NRC) takes a comprehensive look at the body of existing research on marine mammals and ocean noise. This study characterizes the effect of anthropogenic noise on marine mammals as one of the "least understood subjects" in marine science, further noting that "remarkably few details are known about the characteristics of ocean noise, whether it be of human or natural origin, and much less is understood of the impact of noise on the short- and long-term well-being of marine mammals and the ecosystems on which they depend."¹⁵ In addition, the U.S. Commission on Ocean Policy's (USCOP) Final Report, *An Ocean Blueprint for the 21st Century*, makes it clear that "very little is known about marine mammal physiology, including baseline data on hearing, making it difficult to assess the potential biophysical impacts of noise on marine animals."¹⁶ Although it is widely assumed that noise impacts marine environments, the impacts associated with natural geophysical and biological sounds (ambient noise) and those induced by human beings through various ocean activities are not easily parsed out, and in many situations and environments, impossible to segregate.

The National Research Council study, which reviewed all available data, found "no documented evidence of ocean noise being the direct physiological agent of marine mammal death under any circumstance."¹⁷ The 192-page report lays out a series of recommendations for improving research on marine mammals and noise, highlighting the substantial lack of knowledge in this field. In 2005, NRC released another report on marine mammals and ocean noise which reveals that many of its earlier recommendations for additional research remain unmet. Although NRC developed a new conceptual model potentially capable of determining biologically significant

¹⁵ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 1.
¹⁶ United States Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century*, Washington, D.C. (Sept. 2004) at 264.
¹⁷ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 6.

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impacts associated with sound in the marine environment, the report concluded that such a model will lack functionality for at least a decade until and unless additional research is completed. Moreover, the U.S. Ocean Commission in its Final Report makes clear that federal agencies must expand their research efforts as well as improve data dissemination in order to fully understand marine mammal interactions with sound.¹⁸ NMMA strongly supports additional scientific research pursuant to NRC and U.S. Ocean Commission recommendations.

NMMA as well as acousticians and marine mammal bio-acousticians understand that there are various parameters still un-calibrated or even measured that effect any proposed modeling effort. The simplest parameters, like calibrated source levels and spectrums of specific noise sources; direct physical oceanographic data and site specific bathymetry; sound speed profiler; and transmission loss and propagation curves unique to specific habitats and influenced by various times of the day, season and climatic conditions, need to be measured. In addition to these parameters, more research is needed on the hearing abilities of each species group of concern, such as their representative audiograms, critical masking ratios for various types of sounds, critical bandwidths of hearing, directional hearing, temporary threshold shifts for various types of sounds and the source levels and spectra of their vocalizations. Still unknown are the actual sound fields that directly cause measurable and statistically significant disturbances that affect the health of the populations. Until such research is undertaken, it seems clear that models and matrices are not operable and should not form the basis of regulatory decisions. The public and stakeholders will lack confidence in Agency management decisions related to sound if the Agency proceeds at this time.

NMFS, for its part, acknowledges the paucity of current data, indicating that "there are no direct data on the effects of many kinds of sound on many species of marine mammals," and that it will be necessary to "extrapolate" to "cover cases of missing data."¹⁹ The lack of science in this area coupled with the agency's desire to move forward with more specific guidelines signals that NMFS plans to pursue a precautionary approach to management, something with which NMMA has reservations. NMMA feels strongly that NMFS should, prior to establishing new sound exposure threshold criteria, initiate a comprehensive research program which seeks to dramatically improve scientific data in this area. This research program should be fully transparent and include public participation and review from the beginning. Only once the research is completed should NMFS begin developing sound exposure threshold guidelines for marine mammals.

Assumptions and Extrapolations are Problematic

NMMA is concerned that NMFS, by seeking to establish a new set of guidelines with an incomplete set of information, is merely replacing one set of generic guidelines with another. In any event, the effort seems forced and premature. The many assumptions and extrapolations the Agency has identified it will need to make are problematic. NMMA believes that the extreme variability in mammalian auditory thresholds undermines the reliability of such extrapolations, which may be inaccurate, imprecise, and often inappropriate for management. Our view is

¹⁸ U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century* at 272.
¹⁹ 70 Fed. Reg. at 1872.

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bolstered by the experts, who have observed that "researchers have generally investigated either very basic mechanisms of hearing or induced and explored human auditory system diseases and hearing failures through these test species. Ironically, because of this emphasis, remarkably little is known about natural, habitat, and species-specific aspects of hearing in most mammals."²⁰ Based on the Notice of Intent, this seems not to have changed. Although NMFS claims to be establishing guidelines "tailored to particular species groups and sound types," its limited data set constrains its ability to do so.²¹ The lack of audiograms is just the tip of the audiometric iceberg. Current science has to offer only limited masked threshold information, and even less on critical bandwidths and directional hearing. The sample size in existing behavioral studies is extremely small and may not be representative of the species that was tested, much less an entire functional hearing group. Furthermore, most controlled audiometric evaluations have been conducted with pure tones and/or narrow band emissions and do not reflect many of the real world sounds of concern. While auditory brain stem ABR studies provide new data on more subjects and hopefully more species in the future, the estimates of hearing sensitivity derived from electro-physiological methods are not as accurate as estimates from behavioral procedures. More importantly, the vast audiometric data needed on absolute hearing, masked thresholds, critical bandwidths, directional hearing, and TTS for various noise and signal types and with various representative species in order for them to act as exemplars are not in hand or on the near horizon.

NMFS has outlined in its notice some of the assumptions it will need to make during the development of its acoustic matrix of threshold levels, including:

1. All species in a functional hearing group have the same threshold;
2. The relatively limited set of data is capable of covering cases of missing data, so that information about the auditory sensitivities of dolphins will apply to "other cetaceans";
3. Applying hearing data from mid-frequency mammals to low- and high-frequency mammals is appropriate;
4. Utilizing data from terrestrial mammals is appropriate;
5. Extrapolating permanent threshold shift (PTS) levels from a limited set of temporary threshold shift (TTS) data, since no data on PTS exist, is appropriate; and
6. Behavioral avoidance constitutes a biologically significant disturbance.

This long list of assumptions that NMFS is apparently willing to make is troubling from both a scientific and a regulatory perspective. The Agency's willingness to apply data across functional hearing groups and even among mammals within the same species fails to account for well-known and well-documented variability in species' auditory characteristics. According to NRC, "the behavioral responses of marine mammals to acoustic stimuli vary widely, depending on the species, the context, the properties of the stimuli, and prior exposure of the animals."²²

²⁰ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 84.
²¹ 70 Fed. Reg. at 1872.
²² Committee on Characterizing Biologically Significant Marine Mammal Behavior, Ocean Studies Board, National Research Council, *Marine Mammal Population and Ocean Noise: Determine when Noise Causes Biologically Significant Effects* (National Academies Press, 2005) at 26.

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Moreover, marine mammals are an "extreme example" of habitat adaptations and adaptations in ear structure and hearing capacity.²³ In other words, external factors affect hearing even within species. It is also known that marine mammals suffer hearing loss with age, and may be impacted by natural sounds as well. The new guidelines proposed by NMFS also fail to consider a wide array of variables, including demographics, habituation and prior experience with loud or sustained noise levels, resource availability, the health of individuals and other factors of individual variability, sound transmission characteristics, ambient noise levels, weather conditions, and others.²⁴ These variables are extremely difficult—if not impossible—to address through broad-based criteria and guidelines.

Marine Mammals and Hearing Thresholds are Largely Unknown

NMMA is deeply concerned about the lack of audiograms on marine mammals available to regulators and other policymakers. Although there are 119 marine mammal species, audiograms are currently available only for 10 species of odontocetes and 11 species of pinnipeds.²⁵ As has been noted, the subject sample size of these species within these investigations has been very small and, in many instances, inclusive of only a single individual. The result is that "direct behavioral or physiologic hearing data for nearly 80 percent of the genera and species of concern for coastal and open-ocean sound impacts do not exist."²⁶

Even with the existing data garnered from available audiograms, it is clear that considerable variation in hearing range and sensitivity exists among marine mammals.²⁷ Given that, NMMA is perplexed as to why NMFS thinks it appropriate to extrapolate data among and across different marine mammal species and even data from terrestrial mammals where none for marine mammals exists.

Defining the audiometric capabilities (audiogram, masked threshold critical ratios, critical bands, directional hearing, TTS) of the functional groups is primary and essential to begin predicting zones of audibility, masking, potential hearing damage and biological disturbance. Defining the spectra and source levels of different sources and species-specific calls is also necessary for mapping areas of concern. Aside from these parameters to which we have repeatedly referred, the physical data on bathymetry, surface and bottom boundaries, acoustical transmission losses, and propagation are all vital parameters that change with location, time, and environmental climatic conditions. The high variability of physical parameters, audiometric limits, and animal behavior make modeling untenable without meaningful data to input.

In addition, science in the area of marine mammals and underwater acoustics seems to be stagnating, something which may only be exacerbated by the current effort to utilize the existing base of incomplete scientific data to draft new sound exposure threshold guidelines. The National Research Council has noted that critical issues about the effects of transient and long-term anthropogenic sound on individuals and populations "remain unanswered," while indirect

²³ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 84.
²⁴ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 95.
²⁵ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 86.
²⁶ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 86.
²⁷ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 86.

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16 effects of sound on marine mammals are "largely uninvestigated."²⁴ Many of NRC's calls for improved scientific research have gone unheeded. Should NMFS proceed with this effort, research may stagnate further out of a perceived lack of need. Since more science is needed, this unintended outcome would be unfortunate. NMFS should take every opportunity to actively encourage independent scientific inquiry in marine acoustic research.

Biological Significance is not Understood

Of particular concern to NMMA is the lack of scientific understanding of what constitutes "meaningful biological disturbance" from marine sound in both the short- and long-term. Although little is known about marine mammals and noise in general, even less is understood about biologically significant disturbance. Long-term effects of noise on individuals and particularly on populations are not known. In many instances, studies that refer to noise effects, particularly of recreational boats, have failed to convincingly parse out noise from physical presence or surface activities. Unfortunately, this has not restrained biologists from making inferences about sound impacts without the benefit of careful acoustical measurements and calibrated acoustical data. It is widely known that scientific investigation into the "biology of disturbance" has not been pursued in a comprehensive manner.²⁵ Accurate assessments of biologically statistically significant impacts from noise are, in most instances, simply infeasible without great leaps of faith in which scientists and regulators rely on a myriad of assumptions and extrapolations.

17 Animal reactions are varied and individuals in social populations or groups can react to the same stimuli differently depending upon the social mix and activities of the group. Determining when a specific noise disrupts normal animal behavior is a difficult task. Even more challenging to determine is whether responses are direct or indirect, and whether there is any biological relevance to an individual's fitness, never mind the population at large. The challenge for biologists and acousticians is documenting when a biologically significant behavioral avoidance occurs, and when such avoidance is statistically significant for a marine mammal population. At present, NMFS can do neither. Much of the existing research on avoidance is based on data gathered from non-repeatable observational studies. Observational studies may prove correlation; they do not prove causation. Indeed, "[c]urrent knowledge is insufficient to predict which behavioral responses to anthropogenic sounds will result in significant population consequences for marine mammals."²⁶ Until, as recommended by NRC in its most recent assessment, scientific research moves beyond observational, correlational data to controlled exposure, dose-response experiments, decision-makers will lack the necessary statistical information regarding likelihood of acoustic reactions across marine mammal species to noise stimuli as well as any meaningful understanding of whether those reactions are biologically important for the animal. That the overwhelming majority of studies are correlational calls into question the validity of NOAA's current efforts to rewrite the guidelines. More specifically, it calls into question the scientific basis for the proposed alternatives.

²⁴ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 43.
²⁵ National Research Council, *Marine Mammal Populations and Ocean Noise: Determining when Noise Causes Biologically Significant Effects* (2005) at 2.
²⁶ National Research Council, *Marine Mammal Populations and Ocean Noise: Determining when Noise Causes Biologically Significant Effects* (2005) at 10.

18 The conclusion by NRC, and what appears to be a general assumption within the regulatory community, that sound from recreational watercraft negatively impacts marine mammals and other wildlife is purely speculative. First, virtually no reliable research on underwater sound levels from recreational boats has been conducted. Calibrated acoustical measurements of spectra and source levels of the myriad of craft are not available. Subsequent propeller noise propagation tests of different boat types in highly site-specific areas have not been conducted. In many of the shallow estuarine and coastal habitats frequented by recreational boaters, the dominant sound spectra produced by recreational watercraft may not propagate or add to ambient noise below the specific frequency cut off limits that are defined by these habitats. Second, a European Commission report indicates that, at present, "no firm criteria for airborne or underwater sound, nor [sic] reliable underwater sound level data are available to evaluate the impact of the use of recreational craft on wildlife."²⁷ Although some biologists have attempted to evaluate underwater sound emissions from boats, these studies have generally employed flawed methodologies and utilized un-calibrated estimates of source levels in poorly defined sound fields. With respect to recreational watercraft, reliable acoustical data should be obtained with standardized measurement methods that are relevant for the type of craft, its operation, and the specific environment of concern.²⁸ For personal watercraft (PWC), no calibrated underwater sound level data are available.²⁹ Since meaningful acoustical data have not been collected, the available studies and inferred negative impacts from sound from recreational boats are baseless. Considerable research remains to be done before any reliable conclusions can be made.³⁰

Sound Science is Critical to Sound Exposure Guidelines for Marine Mammals

19 NMMA supports and encourages additional research related to marine mammals and ocean noise. It is clear that significant knowledge gaps exist and that scientists and policymakers need more information in order to make well-reasoned policy decisions. NMMA applauds NOAA and its partners for the considerable progress they have made in recent years and hopes the Agency recognizes that additional research, both empirical and theoretical, will bolster its ability to protect marine mammals while avoiding onerous and unnecessary restrictions on the regulated community. It is the position of NMMA that all regulatory efforts and federal policy should be guided and informed by sound science, which is capable of withstanding a rigorous peer review by independent experts in accordance with the Office of Management and Budget (OMB) peer review bulletin and which is subject to extensive public scrutiny and review.³¹ Should sound science not be immediately available, the Agency should strive to obtain it rather than relying

²⁷ R.C. Rijkboer et al, TNO Automotive, "Socioeconomic Study on the Current Status and Developments of Technology and Regulations Related to the Environmental Performance of Recreational Marine Engines," prepared for European Commission, Directorate-General Enterprise Directorate E (January 2005) at 74.

²⁸ The European Commission report also noted that acoustic data from boats should take into consideration the potential uses of the vessel, saying, "the use of a recreational craft can be just as important as the sound emission of that craft; and even the sound emission of the craft is determined largely by its user" (69). In other words, sound emissions from recreational watercraft are highly subjective and will be difficult to measure with much precision. Rijkboer et al (2005) at 8. The European Commission study concluded that "reliable data should be based on a standardized measurement method that is relevant for the type of craft and its use. Such a method is not yet available. For personal watercraft (PWC) no underwater sound level data are known at all."
²⁹ Rijkboer et al (2005) at 9.
³¹ Office of Management and Budget, Final Information Quality Bulletin for Peer Review, (Dec. 16, 2004).

NRC has developed a model with which regulators, policymakers, and researchers can assess the potential impacts of acoustic disturbances on marine mammals, although the current state of scientific research led NRC to conclude that "we are a decade or more away from having the data and understanding of the transfer functions needed to turn such a conceptual model into a functional, implementable tool."³² It seems abundantly clear to NMMA that NMFS should shift its focus and rededicate its available resources to collecting the data and conducting the research needed to make NRC's conceptual model a viable management tool.

17 In any case, the National Research Council and the U.S. Commission on Ocean Policy have emphasized the need to restore balance and common sense to management by assessing risks to marine mammals with an eye toward biologically and statistically significant disturbance. Both NRC and USCOP have recommended statutory changes to the current definitions of "harassment" under the Marine Mammal Protection Act. In 2000, NRC re-emphasized its previous recommendation to focus on biologically significant disturbances, something which it again reiterated in its 2005 report. More than that, however, NRC modified its recommendation to encourage regulators and researchers to focus on "statistically significant and biologically significant changes in behavior."³³ In other words, that sound may result in behavioral changes does not mean these changes are either biologically significant or statistically significant for the mammal population at large. In some cases, as with the manatee population, avoidance of the boat by the animal is a positive reaction, something which is reflected in the existing manatee management regime in Florida.³⁴ In any case, researchers must increase their understanding of how short-term behavioral changes impact the larger mammal population.

Sound from Recreational Watercraft is not Significant

18 To the extent that marine acousticians increasingly view ocean noise as a cumulative issue, it is important to point out that existing information is extremely limited with respect to underwater noise emissions from anthropogenic sound sources. While, for example, the underwater sound characteristics of a commercial shipping vessel are known, the total contribution of commercial shipping to the ocean noise budget is not. As it stands, "data regarding noise produced by shipping, seismic surveying, oil and gas production, marine and coastal construction, and other marine activities are either not known or are difficult to analyze because they are maintained by separate organizations."³⁵ With respect to recreational boating and private vessel traffic, NRC is clear that underwater sound contributions for recreational watercraft "have not been quantified."³⁶ It has been noted, however, that "pleasure craft do not contribute significantly to the global ocean acoustic environment," although, to be fair, NRC does indicate that some boats could have impacts in specific local marine environments.³⁷

³² National Research Council, *Marine Mammal Populations and Ocean Noise: Determining when Noise Causes Biologically Significant Effects* (2005) at 4.

³³ National Research Council, *Marine Mammal Populations and Ocean Noise: Determining when Noise Causes Biologically Significant Effects* (2005) at 20.

³⁴ NMMA is aware that the current proposal is not inclusive of manatees.

³⁵ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 7.

³⁶ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 50.

³⁷ National Research Council, *Ocean Noise and Marine Mammals* (2003) at 56-57.

19 strictly on a precautionary approach to management, an often imperfect and overly-broad regulatory tool that can function as a disincentive to developing a larger scientific understanding on the natural resource in question. Ultimately, NMMA believes that the application of sound science in regulatory decision making will enhance marine resource management, leading to the most effective—and the most equitable—regulations, should they be deemed necessary.

III. Analysis of Alternatives

20 NMMA appreciates the Agency outlining its proposed alternatives, although we reiterate our earlier claim that sound exposure criteria for each alternative should be specifically outlined for each class of mammals in order for the public to fully understand the potential impacts of the proposed agency action. With respect to the proposed alternatives, NMMA currently prefers to No Action Alternative due to an inability to assess the Action Alternatives in any meaningful way at this time.

NMMA Prefers Alternative I

21 NMMA supports maintaining the status quo until and unless additional research on marine mammals and noise is conducted. NMMA prefers the No Action Alternative primarily because this is the only option we can accurately assess with any degree of certainty. NMMA acknowledges that the current guidelines suffer from a failure to consider duration, frequency, and repetition rate, but unless NMFS provides additional information as has been requested above, NMMA will continue to prefer the No Action Alternative.

NMMA Opposes Alternative II

22 NMMA strongly opposes Alternative II, which would establish a basis for unreasonable restrictions on recreational boating and angling access even in instances when such restrictions would do nothing to protect the targeted species. The selection of ambient conditions to use for these criteria is problematic. Ambient noise extremes can exceed 260 dB re 1 meter from lightning strikes or increase 35 dB with continuous driving rain, both of which can cause TTS. Such extreme variability based on natural environmental conditions begs the question, absurd though it may be: do we regulate the weather?

NMMA sees no basis for a criterion based on human noise sources exceeding the highest average ambient noise level in the area of operation, since such a standard seems to relate neither to a mammal's auditory threshold or the likelihood of biologically significant disturbance, nor does it account for natural, radical fluctuations in ambient noise levels, which clearly demonstrate an individual's ability to cope with variation in noise levels.

Even more concerning to NMMA is the classification of a human noise source exceeding the lowest possible ambient noise conditions as a Level B harassment. This standard would functionally restrict all human activity in the marine environment, which is clearly not the intent of the law and which would do nothing, in our view, to advance marine resource protection in an equitable way. In addition, we believe this alternative fundamentally conflicts with the multiple

use mandates of the National Environmental Policy Act. Alternative II also entails a high degree of unpredictability. The regulated community would be unable to determine whether or not it was in fact disturbing a marine mammal because of the high degree of variability in ambient noise levels, as well as the fact that such a standard has the potential of being radically different depending on the specific marine environment, even if the marine mammal species for which the protection is targeted is the same. The result could be a relatively high threshold for disturbance of a mammal in one marine environment and, in a different environment, an extremely low threshold for disturbance for the same mammal type. This poses significant challenges to both our ability to determine the impact of these criteria as well as cope with any regulations which may emerge from their eventual application.

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NMMA Opposes Alternative III

NMMA opposes the use of behavioral avoidance as a standard for determining an acoustic take under the Marine Mammal Protection Act. As has been noted previously, it is unclear whether behavioral avoidance results in biologically significant harm to the animal. The science on avoidance for many marine mammals is equivocal, often with the same individual mammal responding differently to the same noise source (i.e. approaching the source on one occasion, and avoiding it on another).⁴¹ In social groups, even the composition of individuals can lead to differential responses by individuals and the group. Social communities compound the variability in behavior. Moreover, the science which undergirds avoidance is almost completely based on non-repeatable observational studies, about which we have already raised questions. Much of the observational work was conducted without segregating noise from physical presence and some without any meaningful acoustical calibration. NMFS should not pursue criteria based on behavioral avoidance without the benefit of a long-term research study utilizing controlled exposure, dose-response experiments with appropriate acoustical calibration and bathymetric measurements to estimate sound speed profiles, transmission loss, source levels, etc. Studies must have the statistical rigor to demonstrate biologically significant impacts on the mammal population. In addition, avoidance by marine mammals is often a preferable outcome, particularly when such avoidance results in the animal not being struck by a ship or other vessel.

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NMMA believes that NMFS has failed to provide adequate justification for its 50 percent avoidance standard within its Notice of Intent, and NMMA is not convinced that the body of scientific research on avoidance is sufficient to justify such a criterion. NMMA also opposes the Level A criterion of TTS onset. Temporary threshold shift, while conceivably an indicator of stress on the animal, does not in itself result in irreversible physical harm. Moreover, TTS onset does not necessarily indicate a "disturbance" of a marine mammal. In any event, NMFS should identify the TTS onset occurrence in each of the marine mammal species for which it is pursuing these new guidelines in order for public stakeholders to adequately assess the impact of this criterion.

⁴¹ W. John Richardson et al., *Marine Mammals and Noise* (Academic Press, 1995) at 252, 263; National Research Council, *Ocean Noise and Marine Mammals* (2003) at 90-95, 102-103; Biosonics Research Program, Cornell University Lab of Ornithology, "Effects of Human-made Sounds on the Behavior of Whales," at <http://birds.cornell.edu/bmp/humanMadeSounds.html>, Accessed March 11, 2005.

In addition, the definitions of harassment in the MMPA have resulted in much confusion for both regulatory agencies and the regulated community. The lack of clarity surrounding the statutory definitions of harassment means that potentially any activity by recreational boaters and anglers could be construed as harassment. Within the context of recreational boating and boat engine noise, this lack of clarity becomes more acute, particularly in light of some of the alternatives proposed by NMFS in its Notice of Intent. Preparing more specific guidelines which operate under the current definitions does not correct the fundamental lack of clarity in the MMPA. In 2000, the National Research Council determined that the intent of the MMPA was never to regulate activities that result in minor behavioral changes, but rather activities which cause "meaningful disruptions to biologically significant activities," and made recommendations to clarify the MMPA to that end. The U.S. Commission on Ocean Policy has endorsed this recommendation.⁴²

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Currently, however, the MMPA remains vague and subject to considerable interpretation. The U.S. Ocean Commission was forthright in its assessment of the current challenges with MMPA, noting, "NOAA and USEFWS have had difficulties implementing the 1994 definitions, which has led to public uncertainty with respect to its implications. The lack of clarity means that almost any commercial, recreational, or scientific activity that is noticed by a marine mammal might be defined as harassment. Both agencies assert that the confusion limits their ability to regulate even potentially harmful activities."⁴³ Given this, the current effort by NOAA to establish new sound exposure level criteria, which could result in greater restrictions on human activities in the marine environment, is of some concern. NMMA supports a well-reasoned effort to provide more clarity and certainty on what constitutes harassment. At the present time, however, such action is premature given the lack of reliable and fully developed scientific knowledge capable of providing adequate justification for any specific regulatory threshold, which will compound, rather than correct, the fundamental lack of clarity inherent in the law.

Indeed, the Marine Mammal Commission has acknowledged "available information is often insufficient to accurately assess how existing sound sources may be affecting, or how new sound sources may affect, marine mammals and other components of marine ecosystems. Uncertainty about the effects of various sound sources confounds management efforts to provide suitable levels of protection for marine mammals and marine ecosystems while avoiding unnecessary constraints on those activities that generate the sound."⁴⁴ It is precisely these unnecessary constraints NMMA seeks to avoid.

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To that end, should NMFS continue to pursue this path, it should make it clear that it is not the intention of these guidelines to be used in the development of broad, far-sweeping closures to access to our nation's aquatic resources. Such a regulatory outcome would be ill advised considering the extreme variability with respect to the potential impacts sound may or may not have on marine mammals in their specific habitats. As has been noted previously, one of the

⁴² U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century* (2004) at 269, Recommendation 20-6 of the U.S. Commission on Ocean Policy states: "Congress should amend the Marine Mammal Protection Act to revise the definition of harassment to cover only activities that meaningfully disrupt behaviors that are significant to the survival and reproduction of marine mammals."

⁴³ U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century* (2004) at 269.

⁴⁴ Marine Mammal Commission, *Annual Report to Congress* (April 30, 2004) at 95.

NMMA Opposes Alternatives IV & V

NMMA agrees that noise levels which result in permanent hearing loss (e.g. irreversible cell damage which results in a meaningful change in hearing sensitivity) constitute a disturbance and that well-reasoned efforts should be taken to prevent such an outcome. Nevertheless, NMMA is unclear as to the basis for the 6 dB "safety" factor included in Alternative IV. NMFS should clarify the scientific basis for this criterion. With respect to Level B criterion in Alternative IV identifying disturbance as TTS onset minus 6 dB, NMMA reiterates its comments regarding TTS above. The Alternative V criteria should be expounded upon and discussed for other marine mammal species beyond the Gray Whale. When applied to the Gray Whale, it seems clear that this Alternative would likely have little impact on recreational watercraft, which are unlikely to reach even peak noise levels of 195 dB. Nevertheless, as the criteria are potentially subject to change within different functional hearing groups and for different marine mammals, NMMA would request that NMFS provide sound exposure levels for all other types of marine mammals in its proposed five functional hearing groups. NMMA is also concerned that the criteria outlined in these alternatives fails to account for variability in different marine environments as well as sound propagation characteristics.

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NMMA Needs More Information to Assess Alternative VI

NMMA acknowledges that this alternative appears to be the most reasonable of the action alternatives, but we would reiterate our request to see the sound exposure thresholds for each of the marine mammals in the five functional hearing groups. In addition, NMMA is concerned that this alternative fails to account for the variables involved in sound propagation in specific marine environments. Although we do not wish to register direct opposition to this alternative, NMMA would prefer to retain the status quo and pursue scientific investigations which are specific to the hearing thresholds of specific marine mammal species, rather than relying on data extrapolations across functional hearing groups and across different marine mammal species. Quite simply, to do otherwise would be premature.

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IV. Management Challenges Are Numerous

NMMA appreciates NOAA's desire to adopt new "science-based criteria" for establishing an acoustic take under MMPA. Clearly, the ecological impacts of anthropogenic ocean noise are an important management concern for federal regulators charged with protecting marine mammals. Nevertheless, it is NMMA's view that the science is not yet capable of providing clear guidance to decision makers and is insufficient to aid in the development of good public policy. The Marine Mammal Commission (MMC), an independent advisory group established under MMPA, has elucidated the nature of this problem clearly: "Even if the science were more conclusive and available to decision makers, it might not solve the problem of determining what consequences are acceptable (or not), as a matter of public policy."⁴⁵

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only certainties existing research has been able to demonstrate is that any potential environmental impacts associated with anthropogenic noise are contingent on a wide array of contextual factors that do not seem to be sufficiently accounted for in the proposed alternatives.

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V. Conclusion

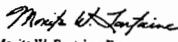
NMMA strongly encourages NOAA to acknowledge that available science remains inadequate to justify the current endeavor. To be clear, NMMA supports additional research and scientific inquiry, and the association hopes the Agency elects to undertake such research rather than proceed prematurely with its current proposal.

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The National Marine Manufacturers Association appreciates the opportunity to provide comment on the Notice of Public Scoping and Intent to Prepare an Environmental Impact Statement on New Criteria for Sound Exposure Threshold Guidelines for Marine Mammals under the Marine Mammal Protection Act and Endangered Species Act. The recreational marine industry and the American boating public have a long history of sound environmental stewardship and NMMA looks forward to a continued relationship with the National Marine Fisheries Service regarding this and other issues.

Please do not hesitate to contact Cindy Squires, Esq. at (202) 737-9766; csquires@nmma.org or Mat Dunn at (202) 737-9760; mdunn@nmma.org if you have any questions or need any additional information.

Sincerely,


Monita W. Fontaine, Esq.
Vice President, Government Relations

From Jim Cummings
Date Monday, March 14, 2005 2:45 pm
To <AcousticEIS.Comments@noaa.gov>
Subject ID 060804 comments in Word file
Attachments NMF5060804F_AEIcomments.doc

65K

As noted in accompanying email, here are my comments in a Microsoft Word doc (Word 2004, Mac), which preserves formatting that makes the comments more readable.

Full comments also appear in the other email, in case that is better for you.

Thanks
Jim Cummings
Acoustic Ecology Institute

Date:
March 14, 2005

From:
Jim Cummings, Executive Director
Acoustic Ecology Institute

to:
P. Michael Payne, Chief
Marine Mammal Conservation Division
Office of Protected Resources
NMFS (F/PR2)
1315 East-West Highway
Silver Spring, MD 20910.

Via email to: *AcousticEIS.Comments@noaa.gov*

Re: I.D. 060804F
Proposed Ocean Noise Criteria, scoping comments on the Notice of Intent

Dear Michael, Brandon, and team,

Thanks for the opportunity to comment on the proposed Ocean Noise Criteria. It's clear that you, your staff, and the science advisory committee have worked long and hard on this, and I commend the effort.

My comments will address three general topics:

1. Questions and comments on the proposed matrix of noise sources and functional hearing groups, and the overall approach suggested by Alternatives 3 through 6.
2. Comments designed to strengthen Alternative 2 and encourage further development of Noise Criteria based on ambient noise levels.
3. Suggestions, in the spirit of scoping and brainstorming, regarding a habitat-based approach to Ocean Noise Criteria, which could represent a more viable way of grounding Ocean Noise Criteria in current ambient conditions.

Regarding the proposed matrix, and the overall approach in Alternatives 3-6

It is important that you consider the waveform of the signal (noise source). In particular, square wave signals are likely to trigger a more dramatic biological response than sine wave signals or organic/natural sounds. I realize that little research has been done on this, but subjective experience, as well as current understanding of auditory signal processing, suggests that there is a need to consider this question. The recent introduction of relatively intense digital noise sources heightens the importance of this point.

Cummings, I.D. 060804F, page 2

Cummings, I.D. 060804F, page 3

In the DEIS, please specify which species for which NMFS feels there is enough data to use the matrix directly, and which species will involve extrapolation of data from others.

At high intensities/dose range, frequency is likely not a primary factor in physiological damage; thus I support the approach you are taking to divide sound sources only by pulsed/non-pulsed and single/series. As currently framed, Alternatives 3-6 do not seem to account for long-range masking (where frequency would make a difference), so the frequency-independent classes of sound are valid.

Consideration of non-auditory impacts is crucial. Using TTS as an analogue for behavioral disruption is not sufficient. There is a need to consider both behavioral disruption in its own right (as clearly stated in the MMPA), and to consider other physiological, non-auditory effects.

Related, there is evidence of severe impacts at relatively low dB levels (most prominently, with the beaked whales in the Bahamas), whether these impacts are caused by physiological (acoustic resonance/rectified diffusion) or behavioral (rapid surfacing) factors. These and other physiological and behavioral effects are not sufficiently addressed by the TTS/PTS criteria.

Similarly, the effects of repeated behavioral disruption and chronic exposure to elevated noise levels are important to consider. In order to address these cumulative impacts, there will need to be some consideration of regional, local, and migratory populations experiencing repeated exposures over the course of months or years. (see McCauley (2000) for a viable cumulative effects model)

Interpretation of precautionary approach/principle - Even though NMFS is using a "conservative" approach, utilizing (your understanding of) the lowest levels shown to cause a response, you are still operating on a principle of the burden of proof being to show harm. That is, you are picking the level that is shown to be harmful, but being conservative the choice. You are not placing burden of proof on showing that there is no harm, as suggested even in the (rather convoluted) definition of the Precautionary Principle used in the April 2004 NMFS presentation to the MMC panel. To do so would mean having standards that are clearly harmless, and only increasing them in response to clear evidence that harmlessness remains at higher levels. The sound levels that are clearly harmless are much lower than those proposed; they would need to be levels where there is little or no behavioral response at all. I say this not to necessarily advocate for such a strict precautionary approach, but to note that your approach falls short of the fundamental definition of precautionary standards.

Species-specific (functional hearing groups) approach - I can see the appeal of this, as responses and sensitivities vary widely. But it is very rare that a noise source will impact only one species or hearing group; the complex web of overlaying permitting that may be implied by the new approach seems unwieldy. It would be preferable to set overall noise standards at levels reflecting the most sensitive species present.

Responses have been observed in some conditions at sound levels of 130-160dB (mortality in Bahamas beaked whales), 90-130dB (behavioral changes and avoidance in Hawaii ATOC tests), and 120-150dB (reduced singing by humpbacks in Hawaii ATOC tests). None of these responses would be addressed under the proposed criteria; it is also important to recognize that we are as yet NOT aware of all the "conditions" that can lead to these responses. Granted, except for the Bahamas incident, these are short-term behavioral impacts; yet many sound sources to be regulated under the new standards (most strikingly seismic surveys) entail rather large areas at received levels of 90-150dB for extended periods (days to weeks). (NOTE: I realize that these studies likely used a dB rating/sound formula different than the one proposed by NMFS; I'm not qualified to make conversions, but the point remains that a TTS-based standard does not likely cover the levels of sound that triggered these observed responses)

By focusing on acute damage (PTS/TTS), you may be missing impacts with more biological importance; it IS true that most mobile species swim away from noise before it's physiologically damaging. However, harassment by noise is far more widespread and needs to be addressed. This ambient noise criteria may be more effective way to deal with (especially) Level B harassment. Even with the new stricter readings of Level B harassment (significant potential/frequency to disturb/abandon or significantly alter behavior), a precautionary approach would reserve judgment on many long-term effects and regulate with care until long-term studies clarify the uncertainties.

The importance of, and need to improve, Alternative 2

While the dominant approach implied by the Notice of Intent relies on determining physiological, auditory impairment across a complex array of species and sound types, your Alternative 2 shines as a (potential) beacon of common sense and clarity. By turning regulatory attention to the current ambient noise conditions, and setting harassment standards based on the idea of not radically changing current conditions, you point the way toward a much simpler and more biologically and scientifically sound approach. The prime advantage of this approach is that it addresses what may be the most biologically important effect of human noise in the sea: masking of acoustic signals important for communication, navigation, or prey detection. The central benefit of this approach is that it starts by considering the existing acoustic profile of the ocean environment, and works to be sure that additional anthropogenic noise does not markedly change the ambient state that exists. It operates from an assumption that the overall acoustic profile of each habitat is an important aspect of the environment, to which the resident and transient species are adapted and accustomed. This seems to be a far more precautionary, and common-sense, foundation for regulation than the other proposed Alternatives, which ignore the overall acoustic health of the environment and focus instead on identifying the limits of tolerance of individual species.

However, as currently framed, Alternative 2 seems to be written in such a way as to be little more than an extremist straw man, easy to discount as unrealistic. As you move forward into the DEIS phase of the project, it's crucially important that this "low end" Alternative be re-structured so as to be worthy of true consideration.

As currently written, just the motor noise of a research or industry vessel would, in most locations, trigger Level 2 harassment standards (louder than the lowest possible ambient noise level). Likewise, virtually any extreme noise source would trigger Level A harassment (louder than the highest average ambient noise level). While this may indeed be a virtuous standard (and one that would likely find widespread public support), it's hardly a reasonable or practical approach, given the current operating standards of most noise-making human activities at sea.

At a minimum, Alternative 2 should be revised to suggest a range of sound intensity above ambient conditions that would be allowable, and a distance at which this threshold would be measured (such distance should increase in relation to propagation models: a greater distance for low frequency noises than for mid or high-frequency). One logical value for such an approach might be the Critical Ratio for the species most sensitive to masking in the area being considered. Thus, for intermittent noise, we might expect that the species could reliably carry on communication or sound perception during the intervals between the pulses, and that even with continuous or series of pulsed noises, it could adapt to the slightly increased ambient conditions created by the introduced noise source. That is, the standard would be based on a range that the animal is known to be able to adapt within.

Masking: Likely occurring on the scale of tens of km to entire ocean basins
I want to take a little time to make the case for why it is important for NMFS to consider masking effects. I realize that there is little research to rely upon in several key areas: current ambient noise levels, the biological importance of masking, or directly measured Critical Bandwidths or Critical Ratios. Of course, the same could be said for the TTS/PTS approach; my contention is that masking is clearly a Level 2 harassment – it involves disruption of hearing signals that would otherwise be audible (and recognizable—see Erbe (2000) below).

What research we do have suggests that masking is likely to take place on fairly wide spatial scales, at least in situations involving extreme source levels of noise. Consider the following:

Erbe, Christine (1998). The masking of beluga whale (*Delphinapterus leucas*) vocalizations by icebreaker noise. Thesis (PhD). THE UNIVERSITY OF BRITISH COLUMBIA (CANADA), Source DAI-B 59/05, p. 2245, Nov 1998, 215 pages.
Propeller noise, Source 203dB, masking at 22km
Bubbler system, source 194dB, masking 15km
These are constant noises; pulsed would be less of an issue for masking, though the repeated pulses of airguns could mask sections of biologically significant sounds.

C. Erbe (2000). "Detection of whale calls in noise: Performance comparison between a beluga whale, human listeners and a neural network." *J. Acoust. Soc. Am.* 108, p297-303.
Losing some frequency components of a call (LF more susceptible) can make the entire communication unrecognizable, even though higher frequency components are audible. Erbe makes a key point, one that we need to keep central—that we must "distinguish" between signal

strong likelihood that moderate to long-range propagation of anthropogenic noises (at received levels of 80-130dB) will cause some masking of important biological communication, especially when the pinnipeds are not in close proximity.

It is also important to hold in mind the fact that many of the extreme human noises now being addressed are relatively new phenomena. Supertankers have become omnipresent in ocean ambient noise profile since the 1970s, when current generation was largely built; similarly, the repetitive pulse of airguns has been a feature only since the 1950s. While these time frames represent several generations for most marine creatures, the NMFS process to develop Ocean Noise Criteria offers the first opportunity to take a comprehensive look at these extreme noise sources.

Regarding airgun activity, the very recent advances into deeper water areas are of special concern: It may be that airgun sound is now bouncing off continental slopes into Deep Sound Channel. The increasing use of repeat surveys (4D surveys) over productive areas is also adding to the concentration of airgun activity in key oil and gas development zones. Depending on seafloor profiles, both of these developments could be impacting large sections of ocean basins. Consider:

Neuldrik, Stafford, Mellinger, Dziak, Fox. Low-frequency whale and seismic airgun sounds recorded in the mid-Atlantic Ocean. *J. Acoust. Soc. Am.* 115 (4), April 2004

"Since this hydrophone array was deployed, the periodic impulses produced by seismic exploration vessels operating around the Atlantic basin were the dominant signal detected. . . . Occasionally the array recorded airguns from more than one location, masking oceanic sounds and on four occasions making the spectrogram data impossible to use. "Airgun survey vessels were often located 3000 km or more from our array, yet airgun pulses were still clearly recorded on each hydrophone. The broadband frequency range and repeated firing of these guns make them a major contributor to the low-frequency sound field in the North Atlantic. . . . Its effect on the baleen whales studied here is unknown; possible effects include masking of conspecific sounds, increased stress levels, changing vocalizations, and ear damage (Richardson et al., 1995). Most of the seismic vessels we located were operating in marine mammal habitat, including that of the critically endangered northern right whale.

" . . . The high received level of these impulses on multiple hydrophones made it possible to estimate the locations of the ships conducting the airgun surveys. During the summer months, airguns operated off Nova Scotia, Canada, probably in support of exploration in the Sable Island region. From spring through fall seismic vessels, presumably commercial, were located working off the coast of western Africa and northeast of Brazil. Seismic vessels operating in other areas of active exploration, such as the North Sea and the Gulf of Mexico, were not observed by this array due to bathymetric blockage.

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detection and signal recognition. The signal was a beluga vocalization containing a base frequency and harmonic and nonharmonic higher components. In the absence of noise, the animal stopped recognizing the call as soon as the lower frequencies dropped below audibility. The higher frequencies, however, would have been audible to much lower sound pressure levels." This study looked at direct audibility; however, similar thresholds will be in play in situations involving masking (and low-frequency noise is much more apt to travel long distances, thus causing this effect at the limits of audibility for the natural calls).

David Kastak and Ronald J. Schusterman (1998). Low-frequency amphibious hearing in pinnipeds: Methods, measurements, noise, and ecology. *J. Acoust. Soc. Am.* 103 (4), April 1998, p2216.
"The harbor seal is about 20 dB more sensitive to signals at 100 Hz than the California sea lion. It is thus more likely to hear low-frequency sounds from man-made sources such as ships and oil-drilling platforms. The effects of such sounds, if heard, are unknown, but potentially deleterious. For instance, harbor seal males produce low-frequency underwater sounds during the breeding season (Hanggi and Schusterman, 1994). It is possible that even if no behavioral reaction to anthropogenic noise is evident, masking of intraspecific signals may occur.

" . . . A potential factor to consider when assessing the possible effects of sound on elephant seals is that these animals are routine deep divers (LeBoeuf et al., 1988). Dives to or below the deep sound channel may expose these animals to higher sound levels than would be predicted based on simple propagation models. In addition, there is some evidence that elephant seals (in contrast to sea lions and harbor seals) do not readily habituate to certain types of sound (Schusterman and Kastak, 1996)."

Brandon L. Southall, Ronald J. Schusterman, and David Kastak (2003). Auditory masking in three pinnipeds: Aerial critical ratios and direct critical bandwidth measurements. *J. Acoust. Soc. Am.* 114 (3), September 2003, p1650.
Northern elephant seals, sea lions, harbor seals: direct measurements of Critical Bandwidth, found that they were 3.2-14.2 times wider than estimated by indirect methods (based on the Critical Ratio). This implies that masking will take place more easily than previously assumed (ie a wider range of noise will mask critical range of signal).

Southall, B. L., Schusterman, R. J., and Kastak, D. (2000). "Masking in three pinnipeds: Underwater, low-frequency critical ratios." *J. Acoust. Soc. Am.* 108, 1322-1326.
Underwater measurements of Critical Ratios. Assumption is that CR does not change significantly based on noise level (at least when noise is less than will cause TTS). While pinnipeds have fairly low CRs, they are still potentially significant, in low frequencies ranging from 10dB for the species with the best ability to separate signal from noise (elephant seal), to as high as 18-20dB at 200-800Hz for the sea lion, and ranging from 15-22dB for higher frequency sounds across all species. Thus there remains a

" . . . Airgun pulses were recorded year-round but were most common from late spring through fall. This pattern is the opposite of the peak occurrences for all baleen whale calls. It is possible that the seasonal patterns seen in baleen whale calls are due to airgun interference: that is, the calls are produced in the summer months but obscured by airguns. However, because calls are detected during some months of frequent airgun occurrence in the fall, because the repetition rate of airguns is such that most whale sounds can be detected between pulses, and because the data were visually inspected, we don't believe that many calls were missed due to interference (cf. Clark and Charif, 1996)."

This final observation does suggest, however, that the seasonal variation in whale call activity across entire ocean basins could be a consideration in scheduling and permitting seismic surveys or other projects emitting extreme low-frequency sounds. Bear in mind, as well, the periods when multiple seismic surveys created such a wash of low-frequency noise that whale calls were impossible to discern; this suggests the need to consider cumulative effects of simultaneous and widely separated projects.

Two notes on the question of biological significance.

One potential criticism of using masking as a measure of harassment is the lack of evidence regarding its "biological significance." This term has entered the statutory language in recent years, and NMFS and others have been struggling to incorporate this threshold of impact into its permitting process. As I read the Notice of Intent, the current Noise Criteria process is not attempting to define biologically significant levels of noise, but rather the thresholds of Level 2 harassment beyond which biological significance needs to be evaluated in issuing permits (i.e., NMFS would still use its own biological analysis to determine whether such harassment, even if triggered, is incidental). Thus, the biological significance of masking need not be proven here, any more than equally unproven long-term biological significance of TTS or behavioral disruption.

While NMFS is bound by the recent additions of "biological significance" to statutory language, the present exercise in seeking scientific basis for decision-making perhaps provides a valid ground to question the practical utility of the "biological significance" standard. While the desire for a concrete scientific basis for regulatory decisions is understandable—not the least in order to provide a legally-defensible standard—the need for proof which is demanded by the "biologically significant" standard seems to be triggering a slide away from the original intent of the MMPA, and indeed from the ability to make biologically sensible regulatory standards. On a practical level, it is nearly impossible to prove the long-term (and often short term) biological significance of auditory masking, behavioral disruptions, TTS, or, arguably, even PTS; indeed, anything short of cumulative deaths can fall short of meeting this standard. While the separate ongoing process to create a mathematical model for calculating the significance of repeated subtle impacts may provide a patch for this problem, it can also be rightly seen as but a heroic attempt to deal with the untenable demands that the statutory language is placing on regulators. I'm not sure what exactly the role or power of agency or academic scientists may be in addressing this problem, though if the agencies discussed the difficulty openly, rather than contorting science to try to comply, that would be a

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start. This comment is just to encourage some straight talk about the perhaps unintended complications created by this statutory language, and to encourage a reconsideration of its usefulness; the simpler, if less concrete, original standards of injury and harassment are perhaps preferable to this ill-guided quest for a certainty which science is likely to find impossible to satisfy.

Habitat-centered Ambient Noise Criteria: an alternative approach

Despite the virtues of the ambient-noise basis of Alternative 2, implementation would be difficult due to the apparent requirement to know the existing ambient noise levels in the location of the activity to be regulated. A practical alternative would be to develop criteria based on a combination of habitat classification and current uses by humans. (Michael Stocker has developed this idea more fully in recent papers presented at 2004 conferences of the Acoustical Society of America and International Wildlife Law)

The human-world analogue to this approach is the standard Noise Criteria (NC) curves used to set acceptable noise levels in various locations, from libraries to offices and industrial facilities. The uses of the space, the numbers of people using it, and the types of communication and activity taking place in each type of location are factors used to set the acceptable noise levels.

As applied in the sea, this approach would establish protocols that consider the existing acoustic profiles of a variety of habitats or use zones, along with the biological robustness/sensitivity of the populations. Possible classifications, each of which has unique acoustic properties, could include:

- Harbors/shipping lanes
- Oil development areas
- Coastal reefs, kelp forests
- Coastal estuaries (including related offshore areas)
- Coastal offshore waters
- Outer continental shelf
- Deep ocean
- Productive fishing grounds

Each zone has a characteristic acoustic profile. Terrestrial bioacousticians, and the US National Park Service, have begun to use the complete acoustic profile of specific habitats as a measure of ecosystem health (see Krause and Gage (2003), Testing Biophony as an Indicator of Habitat Fitness and Dynamics, a report for Sequoia National Park, <http://envirosonic.ces.lmsu.edu/seki/>). Related to this is the concept of "acoustic niches" (see Krause (1987), The Niche Hypothesis, <http://www.wildsanctuary.com/niche.pdf>): animals co-evolve to share the acoustic space, each species occupying distinct "acoustic niches" classified by frequency distribution and diurnal and/or seasonal patterns, thus allowing all species to hear their kind amidst the cacophony of natural sound. Anthropogenic sounds in the sea clutter the acoustic space, disrupting or masking biologically important sounds; in addition, most of the introduced human sounds likely to be subject to these Criteria operate around the clock, and have no diurnal "down time."

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Ocean Noise Criteria based on this approach would allow for much higher levels of introduced human noise (perhaps 160dB or more, measured at a specified distance) in areas with high ambient noise levels (such as shipping lanes and heavily-industrialized zones such as the Gulf of Mexico), while minimizing introduced noise in biologically rich areas such as waters offshore estuaries, or important fishing grounds.

Measurements made in one or several representative locations for each "zone" would be used in permitting activities in similar zones elsewhere.

An advantage of this approach is that it might be more able to be formulated so as to consider chronic stress and long term habitat degradation (factors which have not been fully considered in assessment of the recovery and/or reductions in fish and cetacean stocks).

Ideally, this "zoned" approach to setting Ocean Noise Criteria would set standard thresholds of allowable human noise above ambient conditions in each zone, as suggested above (perhaps based on an average, minimum, or maximum Critical Ratio for local species). It is also possible that an arguably arbitrary figure (such as the 6dB and 12dB factors being suggested in the current ONC Alternatives) could be used. However, if there is a strong need or desire to base standards on more species-specific values, then a few notes are in order:

Avoidance is not an especially trustworthy measure; audiograms (including Critical Ratios) of known species offer a better start, as it gives us a clearer sense of when an introduced noise is audible, which is when it will begin to compete with biologically important sound cues.

As considered in the Notice of Intent and in my first section of comments, the type of noise could/should also be considered: pulsed (occasional or periodic) or continuous, and the waveform factors (rise time or similar analogues) that may suggest whether the sound is likely to be processed/experienced similarly to natural sounds.

When considering ambient noise and masking, long-range impacts must be considered. LF sources will potentially increase ambient noise levels far outside the area of activity, and this will need to be included in the regulating of these noises.

Biologically rich areas will tend to have higher ambient noise levels, yet also will be more susceptible to impact than areas sparse in life. Some consideration of this may need to be factored in (i.e. perhaps slightly lower levels above ambient would be permitted in biologically rich areas, and somewhat higher levels above ambient in areas where there is little ocean life).

Final comments on the need for more data to support both the current Alternative 2, and the proposed habitat-based approach:

This is undoubtedly complex, and there is missing data; of course, the same can easily be said for the Alternatives presently being considered. As with the individual species TTS/PTS approach, there is a need for much more comprehensive baseline data on

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which to ground this approach to Ocean Noise Criteria. However, both current capability and rapidly developing technological systems can provide the needed ambient noise data.

Existing hydrophone arrays include the US Navy's SOSUS (Sound Surveillance System) and IUSS (Integrated Undersea Surveillance System) and the PMEL (Pacific Marine Environmental Laboratory) autonomous hydrophone arrays (HARU), which have been deployed in both the Pacific and Atlantic Oceans. Meanwhile, networks of unmanned underwater observatories and data collection points such as the Inter-related NEPTUNE (North-East Pacific Time-series Undersea Networked Experiments), VENUS (Victoria Experimental Network Under the Sea), and ORION (Ocean Research Interactive Observatory Networks) are under rapid development. And, new free-floating buoy systems could be equipped with acoustic data loggers. All of these resources could be called upon in order to collect, in relatively short order, a representative sample of ambient noise profiles which could be used to flesh out current knowledge and implement a set of Ocean Noise Criteria such as has been sketched out here. As a bonus, these systems could also provide some monitoring capabilities that would collaborate assumptions made during the evaluation and permitting process—an important step often impractical or impossible under current and other proposed standards.

As you can see, these comments have ranged from concrete concerns and suggestions spurred by the specifics of your proposals as laid out in the Notice of Intent, to a relatively well-referenced argument for considering the effects of masking in any final Noise Criteria, to a concluding suggestion (in the spirit of the scoping phase) which would entail a rather substantial re-thinking of the entire process.

I appreciate your interest in comments from the public, and look forward to continuing this dialogue over the coming months.

Best wishes,

Jim Cummings
Executive Director, Acoustic Ecology Institute

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From "Linda Bauch"
Date: Monday, March 14, 2005 3:19 pm
To: <AcousticEIS.Comments@noaa.gov>
Subject: I.D. 060804F
Attachments: SE9EFA00.PDF

208K

Attached are the industry comments on the NMFS Notice of Intent to prepare an Environmental Impact Statement; request for written comments. 70 Federal Register 1671-1675 (January 11, 2005). Please confirm receipt.

Linda V. Bauch, Esq.
Upstream Department
American Petroleum Institute



P. Michael Payne, Chief
 Marine Mammal Conservation Division
 Office of Protected Resources, NMFS (F/PPR2)
 National Marine Fisheries Service
 1315 East-West Highway
 Silver Spring, MD 20910-3226

Re: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Notice of Public Scoping and Intent to prepare an Environmental Impact Statement; request for written comments. 70 Federal Register 1871-1878 (January 11, 2005)

Dear Mr. Payne:

The American Petroleum Institute (API), Domestic Petroleum Council (DPC), International Association of Drilling Contractors (IADC), International Association of Geophysical Contractors (IAGC), Independent Petroleum Association of America (IPAA), National Ocean Industries Association (NOIA), Offshore Operators Committee (OOC) and the US Oil and Gas Association (USOGA) appreciate the opportunity to comment on the National Marine Fisheries Service's (NMFS) Notice of Intent to prepare an Environmental Impact Statement (EIS) to analyze the potential impacts of applying new criteria in guidelines to determine what constitutes a "take" of a marine mammal under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) as a result of exposure to anthropogenic noise in the marine environment.

These eight associations represent thousands of energy companies engaged in all aspects of the offshore oil and natural gas industry. Including the majority of companies that hold most of the oil and gas leases found in federal waters of the Gulf of Mexico. The associations and their members—who are the regulated parties—have a direct interest in NMFS's preparation of the EIS and the implementation of the new guidelines.

NMFS is developing new science-based thresholds to improve and replace the current generic exposure level thresholds that have been used since 1997. NMFS envisions that these new noise exposure criteria will be based on five functional hearing groups of marine mammals paired with four different types of anthropogenic sounds. A matrix will be developed of the functional hearing groups and the types of anthropogenic sounds. This matrix will embody the noise-exposure guidelines NMFS would use to guide determination of what anthropogenic sound level may result in an acoustic "take" by harassment under the MMPA and ESA for each of the different marine mammal hearing groups. The guidelines will be based on exposure characteristics derived from empirical data and are tailored to particular species groups and sound types. Industry supports NMFS's effort to upgrade its current guidelines using a science-based approach that will undergo scientific peer review, as this approach is consistent with the "best scientific evidence available" standard of the MMPA.

- The statutory standard for this EIS for authorizations under the MMPA is "best scientific evidence available." Congress did not intend agency findings to be based on speculation.
- The EIS should present the science in an objective, transparent and unbiased manner, and clearly explain the underlying rationale for its conclusions.
- The EIS must contain a full analysis of economic and social effects of the alternatives, including potential impacts on energy supply, as required by the National Environmental Policy Act (NEPA).
- Under the MMPA, mitigation measures must be "practicable," based on the best science and account for the "economic and technological feasibility of implementation."
- The purpose of MMPA is to protect marine mammals and to develop and carry out programs to support the continued existence of these mammals at their optimum sustainable population.
- All sound sources—natural and anthropogenic—in the oceans should be analyzed and compared to one another relative to frequency, intensity and duration.
- Statistical probabilities of marine mammals actually encountering significant anthropogenic noise should be considered and analyzed during the EIS process.

Industry appreciates the opportunities to participate in this EIS and remains ready to work with government to protect species where sound scientific data indicates a need. Please direct any inquiries to Ms. Linda Bauch, American Petroleum Institute, 202-682-5170.

Betty Anthony
 American Petroleum Institute

W. Williams
 Domestic Petroleum Council

Joe D'Amico
 Independent Petroleum Association of America

Ronan J. Athy
 International Association of Drilling Contractors

Alternative Frameworks

NMFS intends to prepare an EIS to assess the potential impacts of the proposed framework for developing and implementing science-based acoustic "take" criteria. The notice sets forth six alternative frameworks for determining the acoustic threshold level at which both Level A and Level B harassment "takes" might occur. Industry would be better able to comment on the alternatives if the noise exposure criteria were already published. However, as a general matter, industry does not believe that the best available science supports Alternatives I and II. Alternative I would perpetuate the use of the existing thresholds for Level A and Level B harassment. We refer NOAA Fisheries to comments industry previously submitted for detailed discussions of this point.¹ Alternative II appears to be a "zero tolerance" option as the thresholds for both Level A and Level B harassment would result in a "take" in every instance. Industry does not agree with Alternative II as it is not possible to implement without eliminating all other sound from anthropogenic ocean activity.

Industry believes that the sound associated with its offshore operations should be regulated at a level where there is no injury (permanent threshold shift or PTS) or "biologically significant" impacts, i.e., impacts on the survival and reproduction of marine mammals. Further, consideration of sound thresholds should consider biological impacts at a population level. Finally, establishment of sound threshold levels should have a scientific basis and reflect species differences.

At present, available science may indicate that Alternative III and perhaps Alternatives IV-VI may satisfy these criteria. Additional details are needed from the Acoustic Criteria Matrix and other research underway to inform these judgments. Special care needs to be taken with the presentation and interpretation of research as this process continues. For example, there is an incorrect citation of the work by Melme, et al., with respect to gray whale avoidance during migration.

Scope of the EIS

We are concerned with the broad scope of this EIS. NMFS has indicated the areas of interest for evaluation of environmental and socioeconomic effects on marine mammals will include U.S. and international waters. We question whether NOAA Fisheries has the resource capability to extend the scope of this EIS so broadly. Thus, we recommend that the scope of this EIS be limited to the federal waters of the Outer Continental Shelf (OCS). Finally, we seek clarification that the geographic applicability of the acoustic guidelines would not extend beyond federal waters of the OCS.

Sound Science

In addition, the science surrounding the effects on the marine environment as a result of anthropogenic sound in the oceans continues to evolve. Since the science in many marine areas is not fully developed, any evaluation of limited data may produce speculative findings. Industry encourages NMFS to set forth its findings through the EIS process in careful detail; separating assumption from fact, identifying assumptions, methods and extrapolations that underlie its conclusions, and avoiding conjecture. Industry recommends NMFS focus on the following overarching policy issues and legal principles in developing this EIS:

¹ These comments include Joint Industry Comments on the Revised Draft Biological Opinion Gulf of Mexico Oil and Gas Lease Sales 189 and 197, August 22, 2003; Industry Comments on NMFS Notice of Receipt of Application for a Small Take Authorization, April 18, 2003.

K. H. H.

geogill

National Ocean Industries Association

International Association of Geophysical Contractors

Alvin Medley

Allan J. Verratt

US Oil & Gas Association

Offshore Operators Committee

From "Wilson, Judy"
Date Monday, March 14, 2005 3:24 pm
To <AcousticEIS.Comments@noaa.gov>
Subject J.D.060804F
Attachments [MMS comments on NMFS acoustic criteria NOI.doc](#)
The MMS appreciates the opportunity to comment. Our comments are attached.

55K

Judy Wilson
marine biologist
Minerals Management Service

Minerals Management Service Comments on National Marine Fisheries Service (NMFS) Notice of Public Scoping and Intent (NOI) (70 FR 1871 - 1875) to Prepare and Environmental Impact Statement (EIS) on Guidelines to Determine What Constitutes a "Take" of a Marine Mammal Under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) as a Result of Exposure to Anthropogenic Noise in the Marine Environment.
LD. 060804F

Scope

Comments on NMFS's policy proposal to establish guidelines for "take" under the MMPA and the ESA.

1. NMFS's schedule of proposed scoping on the application of new criteria in guidelines to determine what constitutes a "take" of a marine mammal under the MMPA does not currently include plans to hold public meetings in Alaska or Gulf of Mexico States. However, the issue of the impacts of noise on marine mammals is a very important issue to stakeholders in those areas. Stakeholder interest is high in the Gulf of Mexico area because of the level of natural gas and oil exploration, development, and production and in Alaska, in part, but not exclusively, because of potential impacts on the availability of marine mammals for take by subsistence hunters. We recommend that NMFS hold public scoping meetings in these areas, including meetings in Barrow, Anchorage and other areas of Alaska where subsistence users may be affected as well as in the Gulf of Mexico. In Alaska these meetings could possibly be combined with visits for Government to Government meetings.

2. NMFS proposes that the scope of the EIS address the MMPA and ESA as well as species under NMFS and FWS jurisdiction. However, it does not appear that NMFS has included or intends to directly include FWS in the NEPA analysis or in developing the guidelines. FWS with responsibility for implementing ESA and MMPA should be an active partner in this process, for example, as a cooperating agency on the EIS.

3. Sea otters, polar bears, walrus, manatees, and the dugong are marine mammals that are specially protected under the MMPA, and, as such, the current definition of harassment under that Act applies to these species. However, these species fall under the jurisdiction of the FWS. If these criteria will not apply to these species, we recommend explicit statement of this.

4. The definitions of "take" vary under the ESA and MMPA. NMFS must clarify how the guidelines can equally satisfy the multiple definitions.

The definition of harass under the MMPA is "any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild (known as Level A harassment); or has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns including, but not limited to, migration, breeding, nursing, breathing, feeding, or sheltering (Level B

<http://homerail.nmfs.noaa.gov/frame.html>

3/17/2005

harassment)." U.S. military and any research on marine mammals conducted on behalf of the federal government are however, subject to the following definitions of harassment (emphasis added to highlight differences) Level A: "any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild", or Level B: "any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where such behavior patterns are abandoned or significantly altered."

Section 9 of the ESA makes it illegal to take an endangered species of fish or wildlife. The definition of "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct," (16 U.S.C. 1532(19)). The U.S. Fish and Wildlife Service (FWS) issued a regulation further defining the term "harm" to eliminate confusion concerning its meaning (40 FR 44412; 46 FR 54748). And the terms "harass" and "harm" have been further defined by FWS regulations at 50 CFR §17.3, as follows:

- o Harass means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.
- o Harm means an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering.

NMFS has not defined the terms "harass" or "harm" under the ESA. A 1981 FWS Solicitor's opinion (Appendix D, #SO-1 of FWS/NMFS Endangered Species Consultation Handbook) expands on these concepts, holding that an act that harasses wildlife must demonstrate the likelihood of injury to the species and some degree of fault, whether intentional or negligent. Thus, a private landowner who wishes to develop land that serves as habitat for listed wildlife is not harassing that wildlife if reasonable measures are taken to avoid their injury. However, if the modification of such habitat would likely result in death or injury, the species nevertheless would be "harmed." On June 29, 1995, the Supreme Court upheld the FWS' definition of harm to include adverse modification of habitat in the Sweet Home case (Babbitt v. Sweet Home Chapter of Communities for a Great Oregon, et al., No. 94-859 [U.S. Supreme Court 1995]). (A copy of the Supreme Court decision can be found in Appendix A of FWS/NMFS Endangered Species Consultation Handbook).

Comments on the acoustic matrix.

5. NMFS does not mention the acoustic group or process that came up with the matrix nor the upcoming peer-review publication in JASA presenting the matrix. If the public is to comment on the scope of the EIS and proposed alternatives then the public should have this information available to review. It may be premature to conduct a NEPA analysis on guidelines to implement the acoustic matrix when the utility of the matrix has yet to be tested. We recommend that an appropriate interim approach would be to assess the utility of the matrix on a case-by-case basis during the MMPA permitting and

authorization process (and ESA consultation process) before developing and adopting guidelines.

6. With respect to functional hearing groups, we recommend that you specifically describe and discuss whether all mysticetes will be subject to the same acoustic criteria matrix to estimate take or whether, in cases where data are available to indicate that the functional group criteria are inappropriate (either set too high or too low) for a specific species, NMFS will apply modified criteria. We request that you particularly address what criterion will be used to determine Level B harassment takes in bowhead whales.

7. NMFS proposes to divide marine mammals into 5 functional hearing groups and defines those groups. The EIS should specify how sperm whales are classified. The Federal Register notice states that the mid-frequency cetacean functional hearing group will include "all odontocetes species (dolphins and porpoises) not included in the low or high frequency groups". The placing of the words (dolphins and porpoises) in parentheses after this statement, as if this is the group of odontocetes under consideration, is confusing. We assume that sperm whales will be placed in the mid-frequency cetacean group. However, we recommend specific statement of where sperm whales will be placed.

8. With respect to estimating exposure, the estimate of the level of take of a marine mammal species or stock due to a proposed action that introduces sound into the marine environment requires some additional estimate of the level of sound received by individuals of that species or stock. However, the propagation characteristics of sound from a given source can be highly site specific. Sound propagation must be addressed in the EIS. We also request that you describe and discuss whether you foresee any new procedures or regulations to determine sound propagation if these new criteria are applied.

Alternatives

9. NMFS proposes to base the new proposed noise exposure guidelines on the five functional hearing groups of marine mammals as well as the four different categories of anthropogenic sound that will be in the upcoming matrix. It is likely that the alternatives to apply the matrix in policy making that NMFS proposes, particularly 3-6, will be the subject of much debate during the NEPA process. Alternative 1 adopts the status quo (or no action alternative), which we assume to be using 160 dB for level B and 180 dB for level A. This is not a realistic alternative because the best available science developed since the late 1990's would be ignored. Both the MMPA and the ESA require using the best available scientific and commercial data available.

10. NMFS characterizes Alternative II as the "precautionary approach" based on "very conservative behavioral response data." There is no one currently accepted definition of the precautionary approach. Where information is lacking, the ESA and the MMPA promote an approach that is protective of the species and gives benefit of the doubt to the species. The feasibility of alternative 2 is minimal and perhaps not even viable in that it

assumes that we know the ambient noise in the "area of operation" which is highly unlikely.

11. With respect to Level B harassment take due to a sound that causes avoidance: the probability that the sound will actually cause avoidance may, in at least some situations and some species, vary among types of individuals and may vary depending on context. However, as described in the current Federal Register Notice, it is unclear if the criteria with respect to Level B harassment in some of the alternatives is not blurring the distinction between predictions about the probability of take of the average individual within the population or stock and predictions about the level of take of individuals that are based on a range of probabilities of take. This needs to be clarified by NMFS to allow a more thorough consideration of the alternatives.

12. The text (70 FR 1873) for Alternative III states: "defining a Level A harassment take as that exposure which results in a temporary shift in hearing sensitivity (TTS) and a Level B harassment take as that exposure estimated to result in a 50 percent behavioral avoidance for each species or group of species."

As written, it is unclear what the 50 percent behavioral avoidance means, and thus, the criterion is unclear. It is also unclear what the ramifications of these criteria might be if NMFS implements them. We recommend you address in the DEIS the following questions regarding how the criterion for Level B harassment in Alternative III will be evaluated and implemented:

Does this mean there is a "take" if: 50 percent of the time an individual of this species hears it, it is likely to avoid the sound? Does this imply that, on average, 50 percent of the individuals in the population that are exposed to the sound will avoid it? How will NMFS calculate 50 percent behavioral avoidance? Will separate 50 percent avoidance levels be estimated for different segments of a population if the best available information indicates behavioral avoidance is more or less likely in some segments (e.g., females with calves) than other segments (e.g., adult or juvenile males)? Will separate avoidance levels be estimated for some behavioral categories of whales (e.g., migrating versus feeding) if available data indicate that the likelihood of an individual exhibiting avoidance after exposure to a sound is more likely when the species is engaged in one behavior than another? Will long term avoidance and temporary avoidance be treated the same? Under this alternative, would it be considered a Level B harassment if it was predicted that the sound would cause, on average due to individual responses, 15 percent of the population to avoid an area?

13. We also recommend you explicitly define avoidance. How far must marine mammals avoid the sound to be categorized as doing so (e.g., 0.05, 0.5, 1, 5, 10 km, etc.)?

14. We recommend an additional alternative that defines a Level B harassment take as that exposure estimated to result in behavioral avoidance by a lower percentage than 50% (for example, but not necessarily, 25%).

Potential Impact of the Application of these Criteria on Availability of Marine Mammals for Taking for Subsistence Use

15. A major issue in Alaska coastal waters, especially in, but not limited to, the Beaufort Sea, is the potential impact of human generated noise on the availability of marine mammals for take for subsistence uses, and on the use of areas by marine mammals for feeding. Currently, one of the conditions (specified in Section 101(a)(5)(A)(i) of the MMPA) that must be met for the authorization of the incidental but not intentional taking of marine mammals is the requirement that the total of such taking will not have an unmitigable adverse impact on the availability of taking of such species or stock for subsistence uses, as specified in other subsections of the MMPA. Unmitigable adverse impact is defined as:

An impact resulting from the specified activity that: 1) is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by (a) causing marine mammals to abandon or avoid hunting areas; (b) directly displacing subsistence users; or, (c) placing physical barriers between the marine mammals and the subsistence users; AND 2) cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

If the criteria for what constitutes a take are changed, then the set of noise-producing actions that are subject to this additional requirement may also be modified. We recommend that the EIS specifically address how the implementation of these criteria might affect the availability of marine mammals for subsistence take by Alaska Natives. We request specific analysis of potential impacts of the implementation of these criteria for defining Level B harassment take on future procedures and decision-making related to requirements under the MMPA regarding unmitigable adverse impact to the availability of the taking of marine mammal species or stocks for subsistence use and potential resultant impacts on subsistence take.

16. We recommend that, prior to the drafting of the EIS, NMFS evaluate whether additional alternatives might be necessary to ensure that this proposed action does not have unintended consequences on the requirement of the act referred to above related to the availability of marine mammals for take for subsistence activities. We recommend that, in this evaluation, NMFS solicit input from potentially affected groups in Alaska.

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ID: 060804F NOAA NOI

Page 1 of 1
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From: "Petipas, Linda S. CIV (OPNAV CNO)"

Date: Monday, March 14, 2005 3:38 pm

To:

Cc:

Subject: I.D. 060804F NOAA NOI

Attachments: NOAA NOI Cmts Letter 14 Mar 05.doc 22K N45 Comments NOAA NOI 060804F.doc 75K

Mr. P. Michael Payne,
Attached are the Navy comments and cover letter to NOAA NOI ID, 060804F. A fax copy will also be sent.

<<NOAA NOI Cmts Letter 14 Mar 05.doc>> <<N45 Comments NOAA NOI 060804F.doc>>

Linda S. Petipas
Chief of Naval Operations (N45)

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Ser
11 Mar 05

Mr. P. Michael Payne, Chief
Marine Mammal Conservation Division
Office of Protected Resources
National Marine Fisheries (F/PR2)
1315 East-West Highway
Silver Spring, MD 20910

Dear Mr. Payne:

The National Marine Fisheries Service (NMFS) published in the Federal Register on January 11, 2005, a notice of public scoping and intent (NOI) (70 FR 1871) to prepare an environmental impact statement (EIS). The purpose of the EIS is to analyze the potential impacts of applying new criteria in guidelines to determine what constitutes a "take" of a marine mammal under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) as a result of exposure to anthropogenic noise in the marine environment.

The NOI describes NMFS's intention to replace Level A and Level B harassment thresholds with guidelines based on exposure characteristics that are derived from empirical data and are tailored to particular species groups and sound types.

We support NMFS's efforts to establish guidelines for an acoustic impact criteria reflective of best available science however, there must be flexibility in applying the criteria, tailoring it as necessary to fairly encompass the effects of the action. There are three areas of key concern that we would like to highlight: [1] the reference to "status quo" when no single "status quo" criteria seems to exist; [2] not clearly allowing for the use of "best available science" to supplement or replace any of the proposed alternatives; and [3] using the NOI to develop regulations instead of developing guidelines. Guidelines are more flexible than regulations and allow for quicker revisions to incorporate the evolution of best available science. We have further detailed our concerns regarding this proposed action in enclosure (1) of this letter. If you have questions regarding Navy comments on NMFS's Notice of Intent to prepare an EIS, please contact Ms. Linda Petipas, Environmental Readiness Division at (703) 604-1233 or linda.petipas@navy.mil.

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4	All	Permanent Threshold Shift (PTS) and Temporary Threshold Shift (TTS) issue, Aud Level A and Level B Harassment Issue.	<p>a) Navy scientists agree that the best available science has established temporary threshold shift (TTS) as the appropriate impact threshold listed for marine mammals and the process outlined for estimating permanent threshold shift (PTS) from TTS data. Navy experts agree that the most reasonable choice of criteria for Level A harassment would be PTS. Navy experts agree that the most reasonable choice of criteria for Level B harassment would be TTS, and, as appropriate, to address potential long-term sub-TTS biologically significant effects, a level 5 dB lower than TTS.</p> <p>b) The extrapolation from marine mammal species for which there is knowledge of exposure effects to those for which there is not, and the extrapolation from terrestrial mammals when no information exists for the class of mammals considered, are standard approaches used by the scientific community. Such extrapolation is consistent with the best available science.</p>
5	All	Noise categories Issue.	<p>a) There are many and diverse types of man-made noise. It is too limiting to put them into two general categories of impulsive and non-impulsive. There is no mention of bandwidth of the signal.</p> <p>b) There is no distinction between the properties of a signal at the source from the signal at range (i.e., at the receiver).</p> <p>c) There is no distinction made between different sound sources (e.g., sonar, seismic, explosive, etc.).</p>

6	1871	Summary	<p>NMFS will be preparing an EIS to analyze the potential impacts of applying new criteria in guidelines to determine what constitutes a "take" of a marine mammal under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) as a result of exposure to anthropogenic noise in the marine environment.</p> <p>Section 3(18)(A) of the MMPA defines "harassment" as:</p>
7	1872	Back-ground	<p>NMFS will be proposing to replace the current Level A and Level B harassment thresholds with guidelines based on exposure characteristics that are derived from empirical data and are tailored to particular species groups and sound types.</p>
8	1872	Proposed Action	<p>Para. 3. "These values would represent the noise-exposure criteria that NMFS would use, at least in part, to guide determination of when an anthropogenic sound results in an acoustic "take" by harassment under the MMPA or ESA for each of the different marine mammal hearing groups."</p> <p>The criteria would also categorize all anthropogenic sound into four different types: single pulses (brief sounds with a fast rise time); single non-pulses (all other sounds); multiple pulses in a series; and multiple non-pulses in a series.</p>
9	1872	Proposed Action	<p>a) Define "brief" and "fast" with relation to sounds and rise time.</p> <p>b) Are criteria for the source or receiver? Navy scientist assert for the receiver-based criteria, based on TTS/PTS science.</p>

Enclosures: 1. Navy Comments Regarding the National Marine Fisheries Service NOI to Prepare an EIS

M. S. BOENSEL
Captain, U.S. Navy
Director, Environmental Readiness
Division (OPNAV N45)

CNO (N45) Comments for:
Department of Commerce National Oceanic and Atmospheric Administration [I.D. 066804F]
Federal Register/Vol. 70, No. 7/ Tuesday, January 11, 2005/Notices

1	All	General Comments	Regulation vs. Guidelines Issue.	<p>a) While the NOI states these criteria will be used to establish guidelines for acoustic impact criteria, at the Silver Springs, MD scoping meeting, it was stated that the criteria might be used for regulation (means to establish reg). Navy recommends establishment as guidelines. As such, the guidelines should be flexible and allow for revisions reflecting the best available science.</p>
2	All	Application of Criteria Issue.	Application of Criteria Issue.	<p>a) We support NOAA's efforts to establish acoustic impact criteria reflective of best available science, noting that there must be flexibility in applying the criteria, tailoring it as necessary to fairly encompass the effects of a particular action.</p>
3	All	Sound source characterization Issue.	Sound source characterization Issue.	<p>a) One size does not fit all for sound sources. The grouping of species and the categorization of anthropogenic sound are good. Although this creates a rather complicated "matrix" of possible exposure thresholds, a subset would be needed for any particular standardized and we encourage NOAA to restrain from narrowly defining impulsive sounds based on time duration alone (without regard to the number of waveform cycles, rise-time, or frequency bandwidth). The action proposed should be allowed to define (with justification) if the sounds of interest are impulsive-type or non-impulsive.</p>

15	Alternative 6	A sixth alternative defines Level A harassment take based on estimated PTS onset (as in Alternatives 4 and 5), but requires a higher probability of exposed animals experiencing a meaningful change in hearing sensitivity above merely the onset of tissue injury, such as 6 dB of PTS. Under Alternative 6, Level B harassment take would be defined as exposures estimated as 6 dB below those required to cause PTS onset.	<p>a) Navy experts feel this alternative is too aggressive and is indefensible.</p>
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10	1873	Alternative 1	A no action alternative would perpetuate the use of the existing threshold for Level A harassment (sound pressure level of 180 dBrms re: 1µPa) (hereafter dB SPL), and Level B harassment (160 dB SPL for impulse noise and 120 dB SPL for continuous sound) that has been used for the past six years.	<p>a) Describing the Alternative I (No Action Alternative) 180/160 dB re 1 µPa SPL impact thresholds as "current Level A and B harassment thresholds" or the "status quo" is misleading. Navy experience is that it appears that different criteria have been used in different circumstances. Recent scientific studies have shown that energy flux density as a more appropriate metric for sonar effects analysis. Limiting the criteria to the "status quo", in light of recent scientific developments, is inappropriate based upon NOAA's prior application of differing criteria.</p> <p>b) All alternatives should include a clause to allow for the development of "best available science" to be considered.</p>
11	1873	Alternative 2	A second alternative is based on a very conservative behavioral response data for marine mammals. Under this alternative takes would occur at the SPL at which the most sensitive species first begin to show a behavioral response. Level A harassment would occur if the received noise from a human source exceeded the highest average ambient noise level in the area of operation. Level B harassment would occur if the received noise from a human source exceeded the lowest possible ambient noise condition.	<p>a) Alternative I has no scientific data to support such a recommendation. The idea of basing impact thresholds for animals on the estimated ambient noise level in an area, rather than the animals' estimated susceptibilities to sound is not scientific. This amounts to saying that if an animal can hear a sound, it is harassed. This is an extreme interpretation of the MMPA and not supported by the NOAA version of the MMPA. The highest average ambient noise level in any given part of the ocean may not be substantially different from the lowest average ambient noise level.</p> <p>b) All alternatives should include a clause to allow for the development of "best available science" to be considered.</p>

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From "Michael Stocker"
Date: Monday, March 14, 2005 4:02 pm
To:
Cc:
Subject: Revised and corrected comments on Noise Criteria
Attachments: NOAA Ocean Noise Criteria_scoping_comments_Michael Stocker.doc

Revised and corrected 3/14/05

Thanks

Michael Stocker

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12	1873	Alternative 3	A third alternative would define a Level A harassment take as occurring at that level of exposure which results in a temporary loss of hearing sensitivity (TTS) but which is fully recoverable. This approach is also conservative because scientific experts in this field do not consider TTS to result in harm or injury because no irreversible cell damage is involved. A Level B harassment take would be defined as that level of noise exposure known or estimated to result in 50 percent behavioral avoidance of a sound source for each species or animal group.	<p>a) Scientific experts knowledgeable in the field of TTS have documented that TTS is not injurious and therefore should not be used as a Level A criterion. This alternative should be removed from consideration for technical reasons.</p> <p>b) All alternatives should include a clause to allow for the development of "best available science" to be considered.</p>
13	1873	Alternative 4	A fourth alternative would determine that a Level A harassment take occurs at that level of noise exposure which results in a permanent loss of hearing sensitivity (PTS) due to non-recoverable cell damage, minus some "safety" factor. This alternative would be more conservative than current workplace standards for humans which permit exposures that result in some degree of PTS over a lifetime for some individuals. A doubling of absolute sound pressure magnitude (in dBA) represents a 6 dB increase in SPL.	<p>a) This alternative is not a realistic, scientifically defensible option. Navy feels that alternatives need to be "reasonable" and this one does not meet that criterion.</p> <p>b) All alternatives should include a clause to allow for the development of "best available science" to be considered.</p>
14	1873	Alternative 5	A fifth alternative defines a Level A harassment take as noise exposure estimated to result in PTS onset and Level B harassment take as noise exposures consistent with TTS onset for each animal group.	<p>a) Navy experts agree that the most reasonable choice of criteria for Level A harassment would be PTS. The most reasonable choice of criteria for Level B harassment would be TTS, and, as appropriate, to address potential long-term sub-TTS biologically significant effects, a level 5 dB lower than TTS.</p> <p>b) All alternatives should include a clause to allow for the development of "best available science" to be considered.</p>

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Michael Stocker
Seaflow, Inc.

P. Michael Payne,
Chief, Marine Mammal Conservation Division,
Office of Protected Resources,
National Marine Fisheries Service,
1315 East-West Highway,
Silver Spring, MD 20910-3225.

March 11, 2005

Re: Ocean Noise Criteria

Dear Mr. Payne,

While I have already submitted a paper to your agency on the EIS for the proposed Ocean Noise Criteria at the January public scoping meeting in San Francisco, those comments were focused more on the definition of "Ocean Noise Criteria" ("ONC" hereafter) and the process of defining as well as evaluating the effectiveness of a suitable noise criteria. The comments herein address marine bio-acoustics issues with a focus on what I believe are the procedural and biological shortcomings of the proposed ONC.

I do want to restate that crafting an ONC is a responsible policy objective, but I feel that care must be taken to create a working document that will be easily modified as more becomes known about marine bio-acoustic adaptations. I believe that we will find this flexibility an important precaution for both the conservation interests as well as the military, civil and industrial generators of ocean noise. This is largely due to the one premise that all interests seem to agree on; that we know very little about how animals receive, perceive and use sound in the ocean.

Our lack of knowledge has driven the strategies of both "camps." The conservationists' call to apply the "precautionary principal" regarding the safety of marine life sometimes seems to fly in the face of some of the biological evidence that the "ocean resource stakeholders" witness while out at sea. As a result, the ocean resource stakeholders tend to discount many of the conservationists concerns. There is an apparent opacity between these increasingly disparate points of view. Unfortunately, if we craft "hard won" noise thresholds based on the current state of our knowledge, we are likely to find ourselves boxed into inappropriate corners once we find out more about bio-acoustic adaptations that we currently know nothing about, and in some cases, do not even possess the tools, the biological models or cognitive ability to evaluate.

Our assumption that pitch is an important perceptual criterion leads researchers to perform frequency sensitivity tests – or "audiograms" on animals. Typical audiograms use sine waves to determine specific frequency sensitivities, but sine waves are "pure tones" not found in nature and may behave in neurologically unpredictable ways for animals who don't have a need for accurate pitch discrimination.⁵ Some animals are distinctly not sensitive to sine wave stimulus⁶ and reveal as much as a 20dB increase in sensitivity if "band limited noise" is used in place of sine waves.⁷ Given this limitation, audiograms taken with sine waves (most of them) need to be discounted to some degree.

As a consequence, establishing permissible noise thresholds based on pitch and amplitude-weighted audiograms is probably omitting some important acoustical perceptions that fish have (and mammals are not adapted to). There are many arguments and much evidence that fish have a stronger need to evaluate time domain cues that are not pitch, or even amplitude related. These cues probably include rate of change, sound source direction, and the phase relationship between particle and pressure gradient information.⁸

For example, when a fish is swimming in chaotic (and loud) water currents, it needs to discriminate relatively minute perturbations in their local soundfield. This perceptual acuity is evident when a trout swimming in a frisky brook locates and captures a caddis fly that has touched the top of the water.⁹ The amplitude difference between the signals would indicate that the noise of the brook does not mask the sound of the caddis fly; these fish have some other way of deciphering delicate signals in an extremely "loud" soundfield. This may account for why fish subjected to high levels of certain types of acoustic energy (low frequency tones or air-gun blasts) may not seem harmed, but when they are subjected to rapid rise time impulse or high crest factor square wave energy at equal or even lower energy levels, the fish are damaged.¹⁰

This would indicate that there are other qualities of sound that we should also include in an ONC that have heretofore been ignored. Dr. Mardel Hastings of the Office of Naval Research has proposed the use of a "Noise Exposure Level"¹¹ that partially addresses this concern, but I believe that there are other aspects of the time domain issue that need to be integrated into the ONC model. This is becoming increasingly evident in the last five years of whale and dolphin strandings. The dramatic rise in these strandings are coincident with the increased use of mid frequency marine digital communications (particularly by the military). These signals are fairly loud, though not necessarily any louder than older "analog" sonar technologies. It is quite possible that these digital signals are presenting extreme time domain information that animals are not biologically adapted to – or are even damaged by in dimensions that we humans do not understand. This may account for the dramatic rise in animal mortality coincident with these new signals.

These concerns are framed in the context of inarine vertebrates, but marine invertebrates – from mollusks to cnidaria – are also biologically adapted to perceive acoustical energy. While the "value" of any invertebrate may not compel us to abandon our ocean enterprises, their biological roles in the marine ecosystem are no less important

A clear illustration of this is contained in the very ONC proposal document.¹² This document makes the example of how the proposed ONC would be applied in the context of gray whales. The document assumes that there are well known and clearly defined sound levels that would induce permanent or temporary threshold shifts (PTS and TTTS) for gray whales. The fact is we actually have no scientific data on what these levels are for gray whales.

If you examine the literature, we find that the assumptions made about gray whale hearing are based on the comparative physiology of the inner ears of gray whales (large mysticetes) against the inner ears of dolphins (small odontocetes) and of terrestrial mammals (chinchillas). These assumptions are further extrapolated from some observations of avoidance behavior of gray whales while migrating. From my perspective, these models fall short of responsible scientific inquiry. If there is an orthodox scientific avoidance of "anthropomorphizing" gray whales, there should probably be an equal avoidance of "chinchillapomorphizing" the whale as well.

An important omission in the gray whale example is that the model exclusively accounts for the inner ear as acoustical receiver. It makes no accounting for any other sound perception pathways through the gray whale body, such as the lipid system in the animal's rostrum.¹³ The assumptions also make no accounting for perceptual nonlinearities across the frequency bands and amplitudes (called "recruitment" in humans).

The reach of these assumptions throw into question the scientific foundations of the proposed levels and how they are to be applied. This also points out another biological shortcoming of the proposed ONC; they are focused almost exclusively on marine mammals. While there are clear legislative reasons for this focus, the assumption seems to be that marine mammals are more adversely affected by noise, and that the other animals in the sea are somehow less sensitive or less susceptible to the adverse affects anthropogenic noise.

The dearth of bio-acoustic information on other marine animals – both vertebrates and invertebrates – is a clear liability in how we establish appropriate noise criteria. Of the estimated 25,000 species of marine vertebrates, we have hearing data on less than 100 animals.¹⁴ These data are based on studies of animal sound perception that are dependent on some fairly blunt tools. By-and-large, bio-acoustic research is limited to only a few accepted scientific methods; evaluating trained behavioral studies in captive settings, examining laboratory induced brainstem electrical responses to acoustical stimulus (ABR), or observing animal responses to acoustical stimulus in their own habitat. While these methods are really all we have, there are obvious drawbacks to each of them.

Perhaps the most significant drawback is that our auditory tests on non-mammalian biota are based on the perceptual priorities of mammals. The most apparent example of this is that mammals seem to have a priority for pitch discrimination that may not play into other animal's sound perception. This is precluded in the presence of the spiral-formed cochlea in mammals that is not found in any other vertebrates. The cochlea is especially not found in marine invertebrates.

than the role of the great whales. In many cases, the one does not live without the other. While the study of marine invertebrate sound perception has largely evaded the curiosity of researchers, slowly we are finding that these animals also depend on adaptations to sound – which we are quite possibly disturbing with our noise.

By these arguments I am not advocating that we abandon the Ocean Noise Criteria proposal, rather I am suggesting that we open up the noise criteria process to include or make way for sound qualities that affect a broad range of marine biota, not just cetaceans. I am also proposing that these criteria are crafted on sound scientific studies of the biota (in their habitat where possible), rather than basing them on models assembled from convenient assumptions.

Thank you for taking the time to consider these comments. Please feel free to contact me for any clarification.

Sincerely,

Michael Stocker
Science Advisor
Seaflow, Inc.

¹ Michael Stocker, Comments of on the National Marine Fisheries Proposed Action for Ocean Noise Criteria January 18, 2005.

² Federal Register Notice: January 6, 2005 DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration LD 060304P "Endangered Fish and Wildlife; Notice of Intent to Prepare an Environmental Impact Statement"

³ Much work has been done on the acoustical role of lipids in and around the skulls of odontocetes over the last 30 years. I am unaware of any studies of this hearing modality in mysticetes. This may be due to the fact that in the mysticetes, this organ extends down the rostrum and connects to the cranium through a porous process on the anterior boundary of the cranium. It does not surround or come into contact with the middle ear.

⁴ National Research Council Ocean Studies Board "Ocean Noise and Marine Mammals" 2003 p.87 National Academies Press

⁵ The liability of sinusoidal frequency testing was first identified in the early days of the Acoustical Society in an article by Rogers H. Gall ("Methods and Apparatus for Measuring the Noise Audiogram" 1929. JASA Vol.1 No.1 p. 147 – 157), but was somehow left behind in the advance of science. Caveats about this generalization were published later by Edmond Prince Fowler, stating that "...the hearing mechanism is not just an electrical hook-up." (See "Is the Threshold Audiogram Sufficient for Measuring Hearing Capacity?" 1943. JASA Vol.13 No.1 p. 57 – 60). Fowler begins his article with the sentence: "From time immemorial hearing acuity has been thought of, and in fact measured, in terms of the distance a sound could be heard." His article infers a spatial relationship to sound that has since been replaced by an "amplitude" relationship to sound as our testing equipment became technologically "refined."

From "Wyenn, Morgan"
Date: Monday, March 14, 2005 4:26 pm
To: <AcousticEIS.Comments@noaa.gov>
Subject
Attachments: NRDC Acoustic EIS Comments.pdf

921K

⁶ Friedrich G. Barth "Spider Vibration Sense" 1998 in "Comparative Hearing: Insects" ed. Ronald R. Hoy, Arthur N. Popper and Richard R. Fay. Pub. Springer, p. 255-256. Spider kleptoparasites can forage in a spider's web without alerting the resident using "sinusoidal gait" that the host spider is unable to perceive.

⁷ J. Speck-Hergströder, F.G. Barth "Tuning of vibration sensitive neurons in the central nervous system of a wandering spider, *Cupiressius scolii*" 1987 *Keys. Journal of Comparative Physiology A* v.16:476-475.

⁸ William Siler "Near and Farfields in a Marine Environment" 1969. *JASA* V.46(2.2) p.483 See also: A.D. Hawkins "The Hearing Abilities of Fish" in "Hearing and Sound Communication of Fishes" ed. W.N. Tavolga, A.N. Popper, R.R. Fay, 1981. Springer-Verlag, p.109

⁹ J. Engelmann, W. Hanko, J. Mogdans & H. Blockmann "Neurobiology: Hydrodynamic stimuli and the fish lateral line" 2000 *Nature* 408, p.51-52.

¹⁰ Caltrans Contract 04A0148 "San Francisco - Oakland Bay Bridge East Span Seismic Safety Project File Installation Demonstration Project: Fisheries Impact Assessment" August 2001 prepared by Robert "Bud" Abbott. These studies were conducted around steel pile driving in coastal waters. Results showed that fish fry exposed to impulse levels >1900dB showed short term mortality. A further study (yet to be published) showed that fish survived greater noise levels when the noise source was a concrete pile (with a slower impulse rise time).

¹¹ Mardi C. Hastings "Noise exposure metrics for auditory and non-auditory damage in aquatic animals" *J. Acoust. Soc. Am.* 116, 2533 (2004)

Please find the attached letter regarding the scope of EIS to analyze new criteria for determining acoustic "takes" of marine mammals exposed to anthropogenic noise, under MMPA and ESA.

I expect to be contacted if any problems arise in the receipt and opening of this e-mail and the attached letter.

Thank you,
Morgan Wyenn
Assistant to Ms. Horowitz

Natural Resources Defense Council



NATURAL RESOURCES DEFENSE COUNCIL

By U.S. Mail, Facsimile and Email

March 14, 2005

P. Michael Payne
Chief, Marine Mammal Conservation Division
Office of Protected Resources
National Marine Fisheries Service (F/PR2)
1315 East-West Highway
Silver Spring, Maryland 20910

Facsimile: (301) 427-2581
Email: AcousticEIS.Comments@noaa.gov

Re: *Scope of EIS to analyze new criteria for determining acoustic "takes" of marine mammals exposed to anthropogenic noise, under MMPA and ESA (I.D. 0608047)*

Dear Mr. Payne:

On behalf of the Natural Resources Defense Council ("NRDC") and our more than 600,000 members nationwide, I hereby submit these scoping comments on the National Marine Fisheries Service's ("NMFS") notice of intent to prepare an environmental impact statement ("EIS") for new criteria to determine acoustic "takes" of marine mammals exposed to anthropogenic noise. See "Notice of Public Scoping and Intent (NOI) to Prepare an Environmental Impact Statement (EIS); request for scoping comments," 70 Fed. Reg. 1871 (January 11, 2005) ("Scoping Notice").

As you know, maritime acoustic activities have the potential to kill, injure, and harass marine mammals and other marine life over wide geographic areas.¹ Thus, we appreciate NMFS's commitment to prepare an EIS analyzing the adoption of these criteria, as the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4331 *et seq.*, requires. By altering the substance of permitting decisions under the Marine Mammal Protection Act ("MMPA"), 16 U.S.C. §§ 1361 *et seq.*, and the Endangered Species Act ("Act"), 16 U.S.C. § 1531 *et seq.*, governing acoustic takes of marine mammals, the new criteria under consideration would significantly affect your agency's protection of these species from the growing risks of ocean noise pollution. The new criteria would apply to

¹ See, e.g., *NRDC v. Evans*, 279 F.Supp.2d 1129 (N.D. Cal. 2003); International Whaling Commission, Report of the Scientific Committee to the International Whaling Commission, at § 12.2.3 and Annex K (2004) (concluding that there is "now compelling evidence implicating anthropogenic sound as a potential threat to marine mammals" at both the "regional and ocean scale levels").

Mr. Payne
Mar. 14, 2005
Page 2

all sources of anthropogenic ocean noise, from military sonar to seismic airguns to explosives to shipping, and would apply to all marine mammals. Given the significance of this proposal, it is imperative that NMFS incorporate the rigorous, objective analysis demanded by NEPA into the earliest possible stages of its planning.

To this end, we offer the following comments and recommendations. Section A of this letter reviews NEPA's general requirements. Section B discusses more particular concerns about the proposed scope of the EIS, including our strong objection to several of the alternatives proposed to be considered, which, for reasons detailed below, fall far short of satisfying the MMPA's definition of "take" and of affording marine mammals the protections required by law.

A. General Requirements of the National Environmental Policy Act

Enacted by Congress in 1969, NEPA establishes a national policy to "encourage productive and enjoyable harmony between man and his environment" and "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man." 42 U.S.C. § 4321. In order to achieve its broad goals, NEPA mandates that "to the fullest extent possible" the "policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with [NEPA]." 42 U.S.C. § 4332. As the Supreme Court explained,

NEPA's instruction that all federal agencies comply with the impact statement requirement — and with all the requirements of § 102 — "to the fullest extent possible" [cit. omit.] is neither accidental nor hyperbolic. Rather the phrase is a deliberate command that the duty NEPA imposes upon the agencies is to consider environmental factors not be shunted aside in the bureaucratic shuffle.

Film Ridge Development Co. v. Scenic Rivers Ass'n, 426 U.S. 776, 787 (1976).

Central to NEPA is its requirement that, before any federal action that "may significantly degrade some human environmental factor" can be undertaken, agencies must prepare an environmental impact statement. *Steamboaters v. F.E.R.C.*, 759 F.2d 1382, 1392 (9th Cir. 1985) (emphasis in original). The fundamental purpose of an EIS is to force the decision-maker to take a "hard look" at a particular action — at the agency's need for it, at the environmental consequences it will have, and at more environmentally benign alternatives that may substitute for it — before the decision to proceed is made. 40 C.F.R. §§ 1500.1(b), 1502.1; *Baltimore Gas & Electric v. NRDC*, 462 U.S. 87, 97 (1983). The law is clear that the EIS must be a pre-decisional, objective, rigorous, and neutral document, not a work of advocacy to justify a decision that has already, in essence, been made.

A few of the elements most pertinent to the instant process may briefly be described as follows:

First, in order to satisfy NEPA, an EIS must include a "full and fair discussion of significant environmental impacts." 40 C.F.R. § 1502.1. It is not enough, for the purposes of this discussion, to consider the proposed action in isolation, divorced from other public and private activities that impinge upon the same resource; rather, it is incumbent on NMFS to assess cumulative impacts as well, including the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future significant actions." *Id.* § 1508.7.

Second, the preparer of an EIS must make every attempt to obtain and disclose data necessary to its analysis. The simple assertion that "no information exists" will not suffice; unless the costs of obtaining the information are exorbitant, NEPA requires that it be obtained. *See id.* § 1502.22(a). If the costs are deemed excessive, then the EIS must explain the relevance of incomplete information, summarize existing credible scientific evidence on the issue, and evaluate impacts using theoretical approaches or research methods generally accepted in the scientific community. *Id.* § 1502.22(c). Similarly, scientific disagreement on relevant issues cannot be ignored. Throughout the document, the agency is required to "insure the professional integrity, including scientific integrity," of its discussions and analyses. *Id.* § 1502.24.

Third, and perhaps most fundamentally, an EIS must also "inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1. This requirement has been described in regulation as "the heart of the environmental impact statement." *Id.* § 1502.14. The agency must therefore "[r]igorous[ly] explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." *Id.* § 1502.14(a). In addition, the EIS must include a discussion of measures designed to mitigate the project's impact on the environment. *See id.* § 1502.14(f). Consideration of alternatives is required by and must conform to the independent terms of both sections 102(2)(C) and 102(2)(B) of NEPA.³

In analyzing new criteria for acoustic takes, the adoption of which will affect permitting decisions across all waters and involving all species of marine mammals, it is especially critical that NMFS give full consideration to all reasonable alternatives for the purpose of minimizing harm. *See, e.g., California v. Block*, 690 F.2d 753, 768 (9th Cir.

³ Section 102(2)(E) of NEPA requires all federal agencies to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. § 4332(2)(E). This requirement is independent of, and in addition to, the alternatives analysis mandated for the EIS.

clear statutory language requiring such consideration, and despite clear evidence that strong—sometimes lethal—behavioral responses and non-auditory injuries occur at decibel levels far below those that produce auditory injury. For example, the U.S. Navy has conceded that some of the whales that died in the well-documented 2000 Bahamas stranding incident were likely subjected to received sound levels well below 180 dB re 1 µPa.³ Similarly, NMFS has concluded that none of the killer whales that showed "abnormal" behaviors consistent with avoidance" in response to sonar use by the *USS Shoup* at Haro Strait in May 2003 were exposed to sound levels above 180 dB re 1 µPa, and that the "most probable" received sound exposure level for these animals was between 169 and 187 dB re: 1 µPa⁴. Yet, under Alternatives IV through VI, it appears that Levels A and B harassment would both be set in excess of that noise level for most cetaceans. *See* Scoping Notice at 1874.

The lack of reference to behavioral responses and non-auditory injuries in these alternatives is particularly confounding given recent evidence that points to such impacts, not auditory injuries, as the cause of the most publicized and controversial impacts of ocean noise on marine mammals: mass strandings. Many of the injuries observed in stranded marine mammals are the result of bubble growth, which can lead to internal organ damage and other physical injuries. Some scientists believe that this bubble growth may be due to a startle reaction that causes rapid ascent, leading to physical injuries similar to the "bends" in human divers.⁵ Others believe that the sonar itself induces or maintains bubble growth, or acts in other ways that lead to the severe injuries observed.⁶ In either case, however, these injuries are lethal and non-auditory. And, again, events like the Bahamas and Haro Strait strandings suggest that these responses may occur at levels far below those that cause auditory injury.

The case of the grey whale further illustrates the inadequacy of Alternatives IV–VI in accounting for behavioral impacts. The Scoping Notice states that fifty percent "behavioral avoidance" of noise by grey whales sets in at 160 dB re 1 µPa, a level of impact that would clearly satisfy the threshold for Level B harassment (i.e., this noise level, for this species, has "the potential to disturb a marine mammal . . . by causing disruption of behavioral patterns, including, but

³ Dep't of Commerce & Sec'y of the Navy, *Joint Interim Report: Bahamas Marine Mammal Stranding Event of 15-16 March 2000* at v. 28 (2001).

⁴ National Marine Fisheries Service, *Assessment of Acoustic Exposures on Marine Mammals in Conjunction with USS Shoup Active Sonar Transmissions in the Eastern Strait of Juan de Fuca and Haro Strait, Washington, 5 May 2003* at 5-6 (Jan. 21, 2005).

⁵ *See* Jepson, P.D., M. Arbelo, R. Deaville, L.A.P. Patterson, P. Castro, J.R. Baker, E. Degollada, H.M. Ross, P. Hernández, A.M. Pocknell, F. Rodríguez, P.B. Howell, A. Espinosa, R.J. Reid, J.R. Iñárriz, V. Martín, A.A. Cunningham, and A. Fernández, "Gas-bubble lesions in stranded cetaceans," *Nature* 425 (2003): pp. 575-576.

⁶ *See, e.g.,* Houser, D.S., R. Howard and S. Ridgway, "Can Diving-induced Tissue Nitrogen Supersaturation Increase the Chances of Acoustically Driven Bubble Growth in Marine Mammals?" 213 *J. Theor. Biol.* 183-95 (2001).

1982); *NRDC v. Evans*, 279 F.Supp.2d 1129, 1164-66 (N.D. Cal. 2003); *NRDC v. U.S. Department of the Navy*, 857 F.Supp. 734, 739-40 (C.D. Cal. 1994).

B. Specific Points Requiring Particular Emphasis

In light of the requirements discussed above, a number of points require further mention:

(1) *Alternatives Analysis*—The analysis of alternatives must be objective, unbiased and searching. In addition to the "no project" alternative (which, in this case, would maintain the current criteria for acoustic takes of marine mammals), the EIS should consider a variety of criteria that would provide different levels of protection to marine mammals from noise-producing activities in the oceans. Because the chosen criteria will be used to determine when Level A and Level B harassment occurs under the MMPA, all alternatives must, at a minimum, satisfy that statute's definitions of such harassment. *See* 16 U.S.C. § 1362(18). In this respect, several of the alternatives proposed by NMFS are inadequate and, importantly, would be unlawful if adopted and used to define Level A and Level B takes under the MMPA.

Specifically, we strongly object to the consideration of Alternatives IV through VI, which fall far short of satisfying the MMPA's definition of "take" and of affording marine mammals the protections required by law. Under the MMPA, as you know, "take" is defined to include the term "harass," which is in turn defined to mean any act of pursuit, torment or annoyance that:

- (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or
- (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, feeding, or sheltering [Level B harassment].

16 U.S.C. § 1362(18). By defining "takes" to include not just physical injuries and potential physical injuries, but also potential disturbances to marine mammal behaviors such as migration and feeding, Congress made clear its precautionary approach toward the protection of these species and its decision to err on the side of caution when the significance of impacts to marine mammals may not yet be understood.

Alternatives IV through VI, which define both Level A and Level B harassment with reference solely to auditory injury (either PTS or TTS), all flout this approach and contravene the law. None allows for the consideration of non-auditory injury or for the impact of noise on marine mammal behavior, despite

not limited to, migration." 16 U.S.C. § 1362(18).⁷ Yet Alternatives IV through VI would each set Level B harassment levels for grey whales between two and five orders of magnitude greater than 160 dB, based solely on TTS or PTS onset data and without any reference to this known behavioral disturbance. *See* Scoping Notice at 1874. If such harassment levels were adopted, they would plainly violate the MMPA.

Because they do not reflect current science and because they take no account of behavioral impacts such as these, Alternatives IV through VI must be rejected as means to define take levels under the MMPA. Rather than spend time and resources analyzing the environmental impacts of alternatives that would, if adopted, be illegal and unacceptable to the public, NMFS should replace these three alternatives with ones that take account both of behavioral impacts and a broad range of physical impacts (not simply auditory impacts). The alternatives should also account for what we know about different species, the characteristics of different noise sources, the settings of proposed actions, and the presence of any particularly sensitive receptors (such as mother-calf pairs or migrating whales).

For similar reasons, we believe that Alternatives III through VI must define Level A harassment by taking account of potential non-auditory injuries as well as auditory ones, not based solely on TTS and PTS data, as now proposed. Auditory impacts are not the only, or even more important, form of injury to be suffered by marine mammals from ocean noise pollution; nor, as we have discussed with respect to strandings, do they necessarily occur at lower decibel levels than other forms of injury.

Finally, we suggest that Alternative III's definition of Level B harassment, which is now proposed as "that level of noise exposure known or estimated to result in 50 percent behavioral avoidance of a sound source," be amended. Scoping Notice at 1874. As proposed, it appears to account only for animals' avoidance of a sound source, not for any of the other important behavioral reactions that may occur—such as changes in feeding behavior, effects on mother-calf interactions, effects on mating behavior, and other social and energetic effects. In addition, by setting the threshold avoidance level at 50 percent, Alternative III as proposed fails to give effect to the MMPA's precautionary definition of Level B

⁷ In fact, the studies cited by the Scoping Notice show that gray whales alter their migration paths when exposed to noise levels of 120 dB, a much lower level of exposure. *See* Malins, C.L., P.R. Mills, C.W. Clark, P. Tyack, and J.E. Bird, "Investigations of the Potential Effects of Underwater Noise from Petroleum Industry Activities on Migrating Whale Behavior" (Anchorage, AK: Minerals Management Service, 1983), and "Investigations of the Potential Effects of Petroleum Industry Noise from Petroleum Industry Activities on Migrating Whale Behavior, Phase II: January 1984 Migration" (Anchorage, AK: Minerals Management Service, 1984) (HTIS PB86-2) (8377). This simply reinforces the inadequacy of setting Level B harassment levels based on sound levels many orders of magnitude greater, based solely on the onset of TTS or PTS.

harassment, which is met when a sound source "has the potential to disturb a [single] marine mammal." 16 U.S.C. § 1362(19) (emphases added).

(2) *Indirect and Longer-Term Effects* – As marine science and the courts have increasingly recognized, intense underwater sound can have a range of deleterious effects on marine mammals and other ocean life—some of which may be easy to overlook in an environmental analysis, because they are indirect or manifest themselves over the long term. An example of an indirect effect is the reduction in availability of prey species. Impacts to fish species from underwater sound are dramatic, and have been shown to include, among other things, greatly decreased catch rates among fishermen across large swaths of ocean. In Norway, for example, catch rates of cod and haddock fell dramatically (by 69 and 68 percent, respectively) in the shooting area of an algae array and did not recover within five days after operations ended.⁸ Fishermen saw a decrease of as much as 50% in cod and haddock catch rates within 6,000 square km around the noise source.⁹ Such results could significantly impact foraging rates of marine mammals. A recent study suggests that giant squid, another prey species of some marine mammals, may also be injured and killed by ocean noise.¹⁰ Other indirect effects include the enhanced risk that animals affected by noise will succumb to ship-strikes or entanglements.¹¹ Longer-term effects include the masking of baleen whale calls and the resulting reduction in animals' ability to communicate with each other and, potentially, to find mates.¹²

⁸ Engås, A., S. Løkkeborg, B. Osa, and A. V. Soldal, "Effects of seismic shooting on local abundance and catch rates of cod (*Gadus morhua*) and haddock (*Merluccius merluccius*)," *Canadian J. Fish. Aquatic Sci.* 53 (1996): pp. 2238-49.

⁹ *Id.* For other evidence of impacts to fish, see McCasley, R., J. Fewrell, and A.N. Pepper, "High intensity anthropogenic sound damages fish ears," *J. Acoustical Soc. Am.* 113 (2003): pp. 638-42, and Tracor Applied Sciences, "The Effects of Algal Energy Releases on the Eggs, Larvae, and Adults of the Northern Anchovy (*Engraulis mordax*)" (1987) (Tracor Doc. No. T-85-06-7001-D) (Amer. Petroleum Inst. Study).

¹⁰ See Guerra, A., A.F. Gonzalez and F. Rocha, "A review of records of giant squid in the north-eastern Atlantic and severe injuries in *Architeuthis dux* stranded after acoustic exploration," Abstract and Presentation to the Annual Science Conference of the International Council for the Exploration of the Sea (2004).

¹¹ S. Todd et al., *Behavioral Effects of Exposure to Underwater Explosions in Humpback Whales (Megaptera novaeangliae)*, 74 *Can. J. Zoology* 1661 (1996); see also M. André et al., *Are Low-Frequency Sounds a Marine Hearing Hazard? A Case Study in the Cowry Islands*, 19 *Proc. Int. Acoustics* 82 (1997).

¹² See, e.g., International Whaling Commission, 2004 Report of the Scientific Committee: Annex K (reporting data on nearby continuous sound produced by seismic surveys); Nienkirk, S.L., K.M. Stafford, D.K. Mellinger, R.P. Dziak, C.G. Fox, "Low frequency whale and seismic airgun sounds recorded in the mid-Atlantic Ocean," *J. Acoust. Soc. Am.* 115 (2004): pp. 1832-43 (describing significant propagation across mid-Atlantic to hydrophones located more than 3000km away); Croll, D.A., C.W. Clark, A. Acevedo, B. Tenby, S. Flores, J. Godwin, and J. Urban, "Biosonetics: Only male fin whales sing loud songs," *Nature* 417 (2002): p. 809 (observing that rise in noise levels from seismic surveys, oceanographic research, and other activities could impede recovery in fin and blue whale populations).

These concerns highlight the importance of considering both the cumulative effects of various sources of noise on the natural resources of an area and the synergistic effects of such acoustic impacts together with other environmental stressors, such as chemical and biological pollution, habitat degradation, fishing bycatch, and ship strikes. Only by analyzing these impacts together can NMFS appropriately evaluate the various acoustic criteria that have been proposed.

(5) *Public Disclosure* – Disclosure of the specific information used to develop and evaluate the proposed acoustic criteria is essential if the EIS process is to be a meaningful one. See, e.g., *LaFlamme v. F.E.R.C.*, 852 F.2d 389, 398 (9th Cir. 1988) (noting that NEPA's goal is to facilitate "widespread discussion and consideration of the environmental risks and remedies associated with [a proposed action]"). For example, NMFS must disclose the role of the acoustic criteria panel that was assembled by NMFS to help develop these criteria, and must also disclose all findings and recommendations of that panel. On March 3, 2005, NRDC sent a letter to Dr. William T. Hogarth of NOAA-Fisheries, expressing our serious concern that this acoustic criteria panel is operating in violation of the Federal Advisory Committee Act, 5 U.S.C. App. 2, § 1 *et seq.*, and detailing our request that proceedings and recommendations of the panel be made public. That letter is incorporated herein by reference.

(6) *Additional suggestions* – Suggestions we have discussed above for improving the substance of the criteria under consideration include (a) accounting for all behavioral and physical impacts, not just auditory ones; (b) accounting for indirect and longer-term effects; (c) making, wherever possible, more fine distinctions between marine mammal species (whereas all whales are now grouped into two categories); (d) treating more conservatively all noise-producing activities with potential impacts on resources of marine protected areas, such as the National Marine Sanctuaries; (e) treating more conservatively noise that may impact particularly sensitive receptors (such as mother-calf pairs or migrating whales); and (f) addressing cumulative and synergistic impacts.

We also suggest that NMFS disclose, in its EIS, any extrapolations from species to species upon which it relies in crafting and choosing its criteria, and that it explicitly evaluate the difficulties of such extrapolations. It is potentially problematic, for example, to rely (as it appears you do) on data from humans, other land mammals, and noise-habituated, captive marine mammals when determining levels of auditory impacts on marine mammals throughout the oceans, especially those that are less likely habituated to sound than the sample populations relied upon for baseline data. The EIS must carefully justify reliance on extrapolations of this type and would be greatly improved by the addition of an alternative that minimized such extrapolations.

The EIS must consider indirect and longer-term effects such as these for each proposed set of criteria evaluated—not simply the criteria's immediate, short-term impacts. See 40 C.F.R. § 1508.8 (requiring analysis of both direct and indirect impacts). This is especially true with respect to Alternatives IV through VI, none of which defines Level A or B harassment with any reference to behavioral, longer-term, or indirect impacts, as opposed to merely direct auditory ones. Scoping Notice at 1873-74. Indeed, the EIS would be greatly improved by the addition of another alternative that would consider acoustic criteria designed explicitly to account for such indirect and longer-term effects.

(3) *Conflicts with Preservation Values* – Because the criteria chosen will be applied in all waters for which NMFS issues permits, this decision will affect the resources and values of many marine protected areas and preserves, including the twelve National Marine Sanctuaries. NMFS must consider these effects. See 40 C.F.R. § 1508.8. Noise pollution is an increasing problem in the Sanctuaries and has been singled out by at least one Sanctuary Advisory Council for action.¹³ It is our strong view that NMFS should consider, as part of the EIS, at least one set of criteria that would treat more conservatively all noise-producing activities with potential impacts on resources of marine protected areas such as the National Marine Sanctuaries.

(4) *Cumulative and Synergistic Impacts* – As mentioned above, in order to satisfy NEPA, an EIS must include a "full and fair discussion of significant environmental impacts." 40 C.F.R. § 1502.1. This discussion must take account of the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future significant actions." *Id.* § 1508.7.

A thorough cumulative impacts analysis is especially important to understanding the harm that may be caused by undersea noise. In reporting that there is "now compelling evidence implicating anthropogenic sound as a potential threat to marine mammals" at both the "regional and ocean scale levels," one of the most prominent scientific bodies studying the status of whale populations worldwide, the Scientific Committee of the International Whaling Commission, has recently stressed the significance of cumulative effects from acoustic activities. International Whaling Commission, Report of the Scientific Committee to the International Whaling Commission, at Annex K § 6.4 (2004). The Committee found that evidence of increased sound from several different sources, including military sonar, ships and seismic activities, was "cause for serious concern." *Id.* at § 12.2.5.1. The Committee also noted "the potential for cumulative or synergistic effects of sounds . . . with non-acoustic anthropogenic stressor." *Id.*

¹³ S. Peledra, "Anthropogenic Noise and the Channel Islands National Marine Sanctuary" (Sept. 28, 2004) (report unanimously adopted by the CNMMS Sanctuary Advisory Council on September 24, 2004, and referred for action to the Sanctuary Manager).

As you know, we are committed to protecting marine mammals and other marine life from the harmful effects of ocean noise pollution. We urge you to give our comments careful consideration and we look forward to working with your agency as this process moves forward.

Very truly yours,


Cara Horowitz
Marine Mammal Protection Project

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Alaska Eskimo Whaling Commission

March 14, 2005

Via U.S. Mail, Facsimile (301/427-2581), and Email (Acoustic.EIS.Comments@noaa.gov)
P. Michael Payne
Chief, Marine Mammal Conservation Division
Office of Protected Resources
NMFS (F/PR2)
1315 East-West Highway
Silver Spring, MD 20910

RE: I.D. 060904F

Dear Mr. Payne,

The Alaska Eskimo Whaling Commission appreciates the opportunity to submit the attached comments on NMFS' Notice of Intent to prepare an Environmental Impact Statement on new criteria for identifying a "take" of marine mammals under the Marine Mammal Protection Act and the Endangered Species Act.

We hope that you will give our comments, concerns, and recommendations serious consideration. Please do not hesitate to call if you have questions or require additional information.

Sincerely,
Maqoq Ahmaogak
Executive Director

cc: AEWK Board of Commissioners
Honorable George Ahmaogak, NSB Mayor
Senator Ted Stevens
Senator Lisa Murkowski
Congressman Don Young
Vice Admiral Conrad C. Lautenbacher
Dr. William T. Hogarth

migratory course at distances exceeding 20 km and where received sound levels are as low as 120 dB. Richardson, W.J., ed. 1999. Marine Mammal and Acoustical Monitoring of Western Geophysical's Open-Water Seismic Program in the Alaskan Beaufort Sea. LGL Report 2230-3; NMFS 2002 Biological Opinion, Endangered Species Act-Section 7 Consultation and Operation of the Liberty Oil Production Island. Consultation No. F/AKR/2001/00889, National Marine Fisheries Service, Anchorage, AK.

Since the statutory protections for this hunt rest on the MMPA's definition of harassment and NMFS' criteria for determining harassment, it is imperative that NMFS include within the scope of its EIS an analysis of how each proposed alternative would affect determinations that a take has occurred during the bowhead whale migration. This is especially important for takes identified through the subtle behavior changes that our whaling captains refer to as "skittishness" - i.e., changes in swimming and breathing patterns, diving under the ice, "hiding" in broken ice or ice floes.

2. Any Change To NMFS' Noise Criteria That Would Make the Incidental Take Standards Applied During the Bowhead Whale Migration Less Conservative Is Beyond the Scope of NMFS' Statutory Authority.

Congress placed the responsibility for implementing the protective measures of MMPA Sections 101(a)(5)(A) and (D) with the Secretary of Commerce, based on behavioral criteria for determining harassment. Thus the harassment standard to which Congress was looking when it enacted these provisions was - and is - capable of picking up both subtle behavioral changes in migrating bowhead whales and large scale deflections of the bowhead migration. Furthermore, the statutory protections of 101(a)(5)(A) and (D) form the basis for a program of ongoing research into the reactions of bowhead whales to different types of industrial noise. It is this research and the data it generates that enables our bowhead captains, NMFS, and offshore oil and gas operators to cooperate in the design of mitigation measures that allow offshore oil and gas activities to co-exist with our bowhead whale subsistence hunt.

This program of research and mitigation enables the Secretary to comply with Congress' intent when it enacted the mandatory provisions of MMPA Sections 101(a)(5)(A) and (D) - to protect our bowhead whale subsistence hunt. Any action by NMFS that would undermine the Secretary's ability to continue implementing this program and protecting our hunt is beyond the Department's statutory authority. Thus NMFS cannot go forward with any proposal to alter its harassment criteria in the absence of a thorough analysis of how each alternative would affect "take by harassment" findings during the bowhead whale migration. NMFS further must demonstrate that any new criteria would be at least as conservative as current criteria.

COMMENTS of the ALASKA ESKIMO WHALING COMMISSION

NOAA NOI TO PREPARE EIS ON NEW CRITERIA FOR IDENTIFYING A "TAKE" OF MARINE MAMMALS UNDER THE MMPA AND ESA

March 14, 2005

1. The Environmental Impact Statement Must Include, for Each Alternative, an Analysis of How Implementation of the Proposed Criteria Would Affect Federal Protections for the Bowhead Whale Subsistence Hunt.

The National Marine Fisheries Service (NMFS) must include in its Environmental Impact Statement (EIS) an analysis of whether, and if so how, each proposed alternative would alter the current standards for "take by harassment" findings during the Bering, Chukchi, Beaufort Seas (BCBS) bowhead whale migration (the bowhead migration).

Marine mammal subsistence hunting by Alaskan Eskimos is exempt from the Marine Mammal Protection Act's (MMPA's) moratorium on the taking of marine mammals by U.S. citizens. 16 U.S.C. 1371(b). Congress further has acted to protect Alaskan Eskimo marine mammal subsistence hunting, especially the bowhead whale hunt, from "unmitigable adverse impacts" resulting from incidental takes during the course of offshore oil and gas operations. MMPA Sections 101(a)(5)(A) and (D), 16 U.S.C. 1371(5)(A & D). NMFS is fully aware of these protections, and through its office of Protected Resources, participates in the annual review of data that form the basis for mitigation measures to protect the bowhead subsistence hunt from harassment-related impacts.

To date, the primary source of incidental takes during the bowhead migration has been noise-related takes by harassment. The traditional knowledge of our whaling captains, supported by scientific research, tells us that bowhead whales become very "skittish" in the presence of even low anthropogenic sounds. For example, we must be very quiet when we are on the ice during the spring migration, because the whales can hear us and they will not sound if they can tell we are there. Similarly, our crew members must be able to paddle the umiaks silently. Even the small sound of a paddle bumping the side of an umiak can spook nearby whales, causing them to dive under the ice, to "hide" in broken ice or ice floes, and to change their swimming and breathing patterns. Based on these types of reactions, bowheads appear to be among the "shyest" cetaceans, and any of the bowheads' behavior reactions to noise make the whales effectively unavailable for taking during our subsistence hunt.

At higher noise levels, such as those generated by seismic activity, our whaling captains tell us and research shows that migrating bowheads will defect from their

3. If NMFS Goes Forward With Its Proposal, It Will Be Necessary to Create a Separate Category of Threshold Criteria for BCBS Bowheads; Any Change To the Current Behavior-Based Criteria for Determining "Take By Harassment" During the Bowhead Migration Would Undermine NMFS Ability To Do This.

From the perspective of NMFS' current proposal, BCBS bowheads are unique among cetaceans. They are subject to a subsistence hunt protected by federal law. They are known to be extremely shy, even in the presence of small anthropogenic noise. The traditional knowledge of our whaling captains has greatly enhanced "outsiders" understanding of these whales. Furthermore, they are the subject of ongoing research into their behavioral responses to offshore industrial noise which has largely corroborated traditional knowledge.

Given these unique characteristics, if NMFS goes forward with its current proposal, it will be necessary to create a separate category of threshold criteria for BCBS bowheads. An analysis of the way in which this might be accomplished must be included within the EIS.

In undertaking such an analysis, NMFS should give careful consideration to the following. As noted, existing behavior-based "take by harassment" criteria are critical to the ongoing research that is needed to develop threshold noise criteria for BCBS bowheads. The research and mitigation program for the bowhead migration, described above, has grown out of NMFS' incidental take authorization process and rests on observations of bowhead whale behavior in the presence of various noise sources and levels. In fact, this is precisely the type of research needed if NMFS is to develop threshold criteria for BCBS bowheads, and the research is privately funded (e.g., McDonald and Richardson 2004; Richardson 2000).

However, if NMFS acts to alter the "take by harassment" criteria for BCBS bowheads in a way that makes these criteria less conservative, the impetus for this privately funded research will be lost. NMFS thus will deprive itself of the very information required to create threshold criteria appropriate to these very shy cetaceans.

4. The AEWK Requests That a Scoping Meeting Be Held In Alaska.

In addition to the above, the AEWK requests an opportunity to meet with representatives of NMFS to discuss the importance of the MMPA harassment standard and noise criteria for the protection of our bowhead whale subsistence hunt. As noted, in Section 101(a)(5) of the Marine Mammal Protection Act, Congress specifically has instructed the Department of Commerce to protect our bowhead whale subsistence hunt from outer continental shelf activities that might result in incidental takes by harassment. Given these statutory protections, the AEWK is surprised that NMFS did not schedule a scoping meeting on this topic for the North Slope or at the very least, Anchorage.

From Ray Cavanagh
 Date Monday, March 14, 2005 10:10 pm
 To
 Cc
 Subject I.D. 060804F
 Attachments Comments-Questions re NMFS NOS of 011105 rc-2005-0314.doc 121K

Comments and Questions on:
 NMFS' NOI (11 Jan 2005) for a Programmatic EIS for
 Impact of Sound on Marine Life

Submitted by
 Raymond C. Cavanagh

Reference: Fed. Reg. Vol 70, No. 7, January 11, 2005, pages 1871 to 1875

P. Michael Payne
 Chief, Marine Mammal Conservation Division
 Office of Protect Resources
 NMFS(F/PR2)

Dr. Mr. Payne:

Attached are comments on the NMFS NOI of 11 January 2005.

Thank you for your kind attention,

Raymond C. Cavanagh

I. Introduction

These comments and questions are submitted by R. C. Cavanagh on behalf of himself and others as private citizens. None of what follows has been supported or endorsed by the authors' employers, by any government organization, or by any non-government organization. Because of multiple inputs, there is occasional redundancy, for which we apologize.

Serious Changes in Policy

We felt the need to make these comments because the NMFS' NOI announcement will indicate to most readers that NMFS plans to establish criteria and thresholds for impact of sound on marine mammals. These would then be "guidelines" for use in compliance actions, with, as discussed at the Silver Spring scoping meeting, potential for formal rule-making (i.e., policy).

'Status Quo' as Fatal Flaw

The representation of a 'status quo' for criteria and thresholds for impact of sound is seriously in error, and biases the NOI severely. We see the only remedy that would be fair and consistent with precedent and existing 'science' would be to retract the NOI and state that the 'status quo' was incorrect as given. There are a number of other reasons to retract (or at least amend) the NOI, as discussed below.

Ambiguous Language

It is difficult to determine from the NOI exactly what NMFS will do and what will result. Consider the following quote from page 1872:

"Purpose of the Action

NMFS will prepare an EIS to assess the potential impacts of the proposed framework for developing and implementing criteria and thresholds. The EIS will analyze the potential environmental impact resulting from implementation of the proposed noise exposure criteria to determine acoustic-based harassment of marine mammals, and alternative noise exposure criteria."

We have worked hard to try to understand this message, but have reached no conclusion. This is typical of our frustration.

Contents of Federal Register NOI Announcement and Statements Made by NOAA at Scoping Meetings — Need for Clarification

Records, Recordings, Transcripts, Minutes, and Recollections of NOAA Statements Made at Public Scoping Meetings — Documentation of Comments and Answers at Scoping Meetings for the Record. Will transcripts from the Scoping Meetings be published? Are NMFS statements made at the meetings part of the record? If not, then there are a number of issues that need clarification in writing. Some inconsistencies between the NOI and NMFS statements at the Scoping Meetings are noted below.

Statements by NOAA at Scoping Meetings Different from or Inconsistent with Statements Found in Federal Register NOI Announcement

http://small.waffle.com/nciffame.html

4 • What Animal Species Will Be Addressed in the Proposed EIS? [Title of NOI Says "Endangered."] The NOI announcement lists as subject: "Endangered Fish and Wildlife." However, the NOI goes well beyond the ESA, and is actually focused on the MMPA for "protected species." It does not seem to cover listed sea turtles, listed fish, or sponges. Hence, the NOI seems to start off with a quite misleading title. What "Fish and Wildlife" will be covered by the EIS?

5 • Guidelines or Policy? Statements from NMFS (e.g., Mr. Payne at the NMFS-HQ Scoping Meeting) indicate that the intended regulatory status of the EIS is not known at this time. It was stated at the meeting that perhaps the results would serve as "guidelines" or perhaps would be formalized for regulation by "rulemaking." We are concerned that an academic exercise (with little basis in hard science) may turn into regulatory policy.

6 • Special Treatment for Explosives At the Seattle Scoping Meeting, NMFS responded to a question with the statement that explosives would be treated differently from the way that other sources (including impulses) were treated. This is not mentioned in the NOI.

7 • Excessive and Time-Consuming Process By the inclusion of examples of criteria and thresholds in the NOI announcement, NMFS suggests that it will establish new criteria and thresholds for impact of all types of sound sources on marine mammals in water (and pinnipeds in air). That these new results, based on "science," will be developed and tested in the EIS process is an ambitious goal. We suggest that to cover acoustic sources and scenarios of interest, the cost of such an endeavor could exceed millions of dollars. Does NMFS have this in their budget? In comparison, work of the NMFS Panel is estimated to have cost about \$1M (with NMFS paying part of the actual costs) — with only a few of the Panel results reflected in the NOI announcement.

8 As discussed at the Silver Spring scoping meeting, NMFS-HQ has had a long-term (at least 3 year) quest to establish criteria and acoustic thresholds for impact of sound on marine life. The NMFS 'Criteria Panel' briefed its results at an NMCC meeting in April 2004, and showed that the work is progressing, but is not finished. For example, there were no thresholds at all for Level B behavioral harassment for any types of sound.

9 • Current Approach as Successful On the other hand, the regulators at NMFS-HQ have embraced an approach over the past several years that makes sense. The approach is to 'vet' criteria and thresholds through public review of formal permits (i.e., incidental harassment authorizations and letters of authorization). This has worked well for previous actions (e.g., ship shock trials, LFA, NPAL, THSS/Seismic, rocket launches) and is expected to work well for pending actions.

The NMFS NOI suggests the possibility of invalidating the recent precedents mentioned. In fact, it more than suggests that the precedents established since 1997 are not based on science, but are "generic." This is not at all true, and is herewith challenged.

Key Issues

- 10 • NMFS' Intention to establish 'guidelines' independent of precedent is counter to NMFS' own historically proven process.
- 11 • The Federal Register announcement is so inaccurate in its assumptions and so naive in its approach as to be viewed as a statement of a non-feasible goal. The "permit vetting process" would then continue to be the best approach for establishing criteria and thresholds.
- 12 • The premises for the proposed criteria and status quo are without basis. The criteria listed in the announcement make no sense and most cannot be justified. The 120 dBms harassment threshold for the 'status quo' for 'continuous' sources has no precedent that we know of (except perhaps the 0% impact level for the long and unique LFA and NPAL signals). By naming 120 dBms as the 'status quo,' NMFS has biased the EIS decision process so much as to make it invalid. If the 'status quo' is stated as the 'no-action' alternative, then the 'status quo' will be argued by many to be the 'status quo' for the future. This has no basis in reality and is challenged here. The only remedy that would be fair

12 and consistent with existing 'science' is to retract the NOI and state that the 'status quo' was incorrect as given in the NOI.

13 • There are very important legal implications here. It is apparent that NMFS has not considered the impact of its NOI — since even the lowest-power sound projectors are likely to require permits under the 'status quo.' A majority of NMFS' Final Rules and Section 7 Consultations documented over the past seven years are found to be inconsistent with the 'status quo,' and it is certain that some will say they should be revised. Suits can be based on the NMFS statements. For example, to even suggest that if an animal can hear sound under high sea state conditions it will be injured is irresponsible.

14 • The proposed classification of sound sources (pulse and continuous) has no connection to 'science,' and many signals at range will fit into none of the four classes.

15 • The proposed use of an energy metric has little basis — especially for projector signals. There are no TTS data for typical sonar pings. The extrapolations from very long duration exposures to short ones, from octave bands to tones, from mammal to man are strictly hypothetical and have no empirical support. Even the application of in-air data misrepresents the science at hand.

16 • For 'impulses,' what constitutes fast rise times and what metric is sensitive to rise time (none mentioned)? Rise time and impact on marine life have not been shown to be correlated, nor have peak pressure and impact. We do not see any acknowledgement that positive impulse has been favored by many as the best predictor of impact of explosives in water. It is the precedent for Level A for ship shock.

17 • The proposition for use of TTS and PTS (plus or minus some number of dB) as the main criteria for Level B and Level A harassment is precedent-setting in itself. Except for ship shock tests, we know of no example of the use of TTS for Level B. We have no examples of the use of PTS for Level A (although 50% eardrum rupture is said to correlate with 30% PTS for octacases in the ship shock EIS). The premises on which auditory impact criteria are both awe weak and ill-defined.

II. Summary Comments and Questions

We take exception to most of the statements and discussions of the NOI. There is very little that we can support, and we request that NMFS retract the NOI as soon as possible. Our objections are not based on subjective technical opinion, but rather on serious, concrete, regulatory and legal issues. Ramifications of the NOI include a significant negative impact on use of all sources of sound in 'water,' even the most benign.

1) What Happened?

How did the NOI get published in the Federal Register?

18 As discussed below and often, the NOI is seriously problematic in its representation of the 'status quo,' new classification scheme for sound sources, unjustified selection of metrics and alternatives, basis in auditory impacts, misrepresentations of recent precedents for criteria and thresholds, misrepresentation of the state of 'science' over the past six years, and approach to funding and managing the development of the EIS.

The NOI was a surprise to most. Did anyone outside NMFS review the NOI for content or implications? Were Navy or MMS or Coast Guard or DARRPA or Air Force consulted? Did NMFS have an understanding of the implications of the notice?

19 What data and expertise will NMFS call upon to develop the EIS? Just as for the NMFS 'Criteria' Panel, it seems that NMFS would have to rely on experts and measurement acts funded primarily by DOD and MMS. In other words, the development of the new criteria and thresholds will strongly depend on the cooperation of the agencies that NMFS spends much of its resources regulating. We suggest that this alone is a potentially fatal flaw in the approach.

20 The recommended solution to NMFS' problem is to retract the NOI, and continue with the historically successful approach for establishing impact criteria and thresholds (namely, through the permitting process and the public 'vetting' that goes with it).

2) "Status Quo?"

Rather than contact each statement of the NOI at this time, we focus on a few key issues. Perhaps the single most serious issue is the definition of the "status quo" (see Table 1 on page 1873) and its position as the "no action" alternative.

We have studied MMPA permits granted by NMFS and concluded that NMFS has not in fact used the 'status quo' over the past six years as a guideline for impact. Because the stated 'status quo' impact thresholds were not recommended by a NMFS 1997 or 1998 Panel (as stated at the Seattle scoping meeting) and because the thresholds have not at all been applied to compliance actions reviewed by NMFS over the past six years, we respectfully request that NMFS retract the NOI.

If the stated thresholds were indeed the 'status quo,' then there would be very few man-made sound sources that could operate in the world's oceans without a permit. Surface ships, fish finders, fathometers, very small explosives, in-water machinery, side-scan sonar, sub-bottom profilers, recreational vehicles, navigation sonars, oceanographic probes, etc. would all have to apply for permits for numerous MMPA and ESA "takes." Ambient noise levels in many ocean areas (e.g., much of the Western Mediterranean Sea) are above the 'status quo' threshold.

According to statements by NMFS at the Seattle Scoping Meeting of 20 January 2005, the 'status quo' thresholds are the result of NMFS Panel recommendations in 1997. We have not seen any outputs from this panel (unless it is the HESS committee, which addressed only high-energy seismic survey sources). We believe that NMFS was referring to the NOAA/NMFS "Criteria" meetings of 1998. We attended these meetings and have detailed notes. Nowhere do we find any indication that the Panel recommended anything resembling the 'status quo.' In fact, the results of the Ridgway et al. and Kastak-Schusterman, et al TTS tests were major topics of the meeting. Dr. Genry supported a proposed set of impact thresholds based on the TTS tests (developed by Dr. Bob Gitsner of ONR and promulgated by Dr. Jim Miller of URI). Dr. Genry then briefed the proposed thresholds at other public meetings (e.g., NMFS-ITM in New Orleans in December 1998). These thresholds were not at all related to the 'status quo' numbers.

That NMFS has consistently applied the 'status quo' standards to compliance actions over the past six years (as stated by NMFS at the Seattle Scoping Meeting) is simply not true. In fact, we are hard-pressed to find a single example of a NMFS-reviewed compliance document that uses the 'status quo' thresholds (other than HESS airgun survey thresholds, and then only partially).

Instead, we find a number of Final Rules and Section 7 Consultation statements that set much different thresholds as precedents. Examples include: CHURCHILL Ship Shock, SURTASS-LFA, NPAL, Polat Mugo EIS, SABRE-DET (Air Force), many permits for seismic surveys, many permits for impact of aircraft noise on animals in water and in air, pile driver actions, small explosive actions, etc. NONE used the 'status quo' thresholds (except perhaps, but only in part, the airgun-survey permits). A list of references and notes on each of the cited compliance documents can be made available, but all of these have passed through NMFS.

Further, to say that impact thresholds used in compliance documents (and approved or reviewed by NMFS) over the past six years are "generic" and not based on the latest "science" is just plain wrong. Examples listed above used essentially the same "science" as is available today. After all, what is new? Certainly nothing for explosives or LFA or NPAL or HF sonars. TTS data for mid-frequency sonars add little to what was available in 1998 (as discussed at the NMFS Criteria Meeting slides of April 2004).

3) Classifications of Sound Sources and Signals

As introduced to the public for the first time in the April 2004 briefings of the NMFS "criteria" Panel to the MMC, the Panel has proposed to put each of the many and diverse types of man-made noise into two classes - impulsive and non-impulsive. We presume that "continuous" in the NOI replaces "non-impulsive."

We argue that the approach that allows the "best science" to be applied is that which treats each source type and scenario on a case basis. After all, there are not very many sources/scenarios that have possible impact on marine life, and hence no real advantage to trying to force sources/scenarios into two classes.

The scope of the EIS appears to be quite broad. Moreover, the EIS will address regulatory policy and legal issues. Technical issues are numerous and difficult. Most of the research of interest is funded by Navy, MBAS and Air Force. NOAA funds very little research on the subject matter of the EIS.

On the basis of the NMFS Criteria Panel progress to date (e.g., no Level B harassment thresholds after three years of work), the draft MBAS EIS for the Gulf of Mexico, the CHURCHILL EIS, the SURTASS-LFA EIS, and the NPAL LOA, we would expect the NMFS EIS to cost a minimum of several million dollars and to take at least 3 years (not including any research or testing). This allows for only a minimal amount of legal support to cover responses to the inevitable suits. Is funding for the whole project approved for the NOAA budget through FY 2007?

Timetable for EIS

What is the schedule for preparing the EIS and having it vetted through the public? A 2-year schedule was stated by NMFS at the Silver Spring scoping meeting. This, as noted above, is very ambitious.

6) Contributions and Participation in the EIS Process

To repeat: what data and expertise will NMFS call upon to develop the EIS? The vast majority of expertise, data and experience is resident in DOD-funded investigators and labs. Might NMFS' unilateral approach to establishing legal guidelines and policy cause other agencies to limit support?

7) Timing and Trust

Among the many questions we have about the NOI, one of the most important relates to timing. NMFS has a number of important actions under consideration for permits (e.g., the MBAS Gulf of Mexico EIS for seismic surveys). Years have been spent in negotiation with NMFS and NMFS' consultants to determine criteria and thresholds for impact that can be justified in court. Once these actions have been "vetted," NMFS will have defensible precedents as we now have for single large explosives (ship shock tests), low frequency projectors (LFA and NPAL), airgun surveys (HESS), and rocket launches (e.g. Vandenberg AFB). Given the technical investigations for these and other permits and the use of the most recent science, it is curious why NMFS would announce the NOI at this time. We think this is a serious issue.

III. Questions and Comments on Specifics

1) What Animal Species Will Be Addressed in the Proposed EIS? (Title of NOI Says "Endangered")

The NOI announcement lists as subject: "Endangered Fish and Wildlife." However, the NOI goes well beyond the ESA, and is actually focused on the MMPA for "protected species." It does not seem to cover listed sea turtles or listed fish. Hence, the NOI seems to start off with a quite misleading title. What "Fish and Wildlife" will be covered by the EIS?

Harassment criteria refer in the NOI to 'Level A' and 'Level B.' These are specific in the MMPA and do not apply to the ESA. What is intended for the ESA?

2) Coordination with the "Regulated"

Was the NOI coordinated with or briefed in advance to the seismic survey industry or the merchant fleet or DoD or USCGS or manufacturers and users of fishfinders, fathometers, sidescan and sub-bottom profilers, or environmental advocates, etc.? Why are so many surprised at the timing and contents of the NOI? Why did NOAA publish numerical thresholds in an NOI?

3) Has NMFS Made Estimates of the Likeliest Impact of the EIS?

For example, what if the 'status quo,' as specified in the NOI, were retained as the 'no action' alternative? Does NMFS understand that very few sound sources in the ocean would not need permits under MMPA? Depending on the definition of "dBrms" (a large issue by itself), merchant ships, fish finders, bottom profilers, recreational vehicles, small explosives, small projectors, most sonars, etc. would need "take"

Why do we recommend that scenarios be treated on a case basis? The properties of the sound field at ranges of possible impact differ widely from one case to the next. For example, the sound field generated by a small shot at harassment range is vastly different from that of a large shot, with increasing differences dependent on water depth, multipath, etc. The signal at range in shallow water for a large shot better fits the 'non-impulsive' category than the impulsive category. A short, tactical sonar pulse does not have a fast rise time, is of small bandwidth, and does not at all fit into the NMFS' defined 'impulsive' category (as was stated at the Seattle scoping meeting).

The architects of the classification approach (according to the scoping meetings, the classification approach comes from the NMFS Panel) do not, it seems, recognize the properties of a signal at range. What is the rise time of a 30 m sonar ping at 2 km? What is the duration of the sound from a 500-kg explosive in typical shallow waters of the US East coast at 60 km? In what class goes the off-the-shelf sonar system with a 0.02 second pulse length and a 10 Hz repetition rate, at range?

There is no mention of bandwidth of the signal. This is a key factor in the detectability of a signal, not to mention the impact on animal hearing bands, etc.

NMFS has been very consistent and rational over the past six and more years in making formal distinctions:

- between single explosives and multiple explosives (different Level B harassment criteria),
- between short-term source transmissions and long-term transmissions in one area,
- among airgun sources and other 'impulsive' sources, such as explosives, pile drivers, sonic booms, and even short sonar pulses,
- among very low-frequency projector transmissions, low-frequency projector transmissions, mid-frequency projector transmissions, and very high-frequency projector transmissions.

None of this is even mentioned in the NOI, and cannot be accounted for in the animal classification scheme. Most importantly, the 'status quo' statement in the NOI is completely contradictory to what has been found in formal NMFS decisions (as stated in Final Rules, Section 7 Consultations, and written opinions) over the past six years.

4) The NMFS Criteria Panel

NMFS has published a recent view of the criteria and thresholds best supported by 'science' in an internet-available briefing (given in April 2004 at the MMC 'Second Plenary Session'). The findings are not at all consistent with precedent (based on recent permits) nor is there any connection to the 'status quo' of the subject NOI. Further, the Panel findings have not been subjected to a formal public review and response process (we, for example, can agree with almost none of the findings as anything but hypotheses).

According to NMFS at the Seattle scoping meeting, the Panel will publish its findings in the Journal of the Acoustical Society of America. Has the paper been submitted for publication? Under what topic (e.g., bioacoustics, underwater acoustics, psychological acoustics)? It is usually the case that the time from submission of a paper to publication is at least one year. Will the paper that was submitted be made available to the public - so that the public can see what the NMFS Panel recommends for criteria and thresholds? If not, the NMFS EIS process will not be at all influenced by the formal NMFS recommendations to be published. Are all Panel members listed as authors of the paper? Is there consensus on the part of the Panel members for all of the contents of the paper?

5) Findings and Development of the NMFS EIS

Who will prepare the EIS? Will it be done 'in house' by NMFS? Will there be outside support? Labs or contractors? Will support be determined competitively? What about conflicts of interest (for example, what if a preparer works under contract/grant part of the time for MMS or DoD)?

Funding for the Preparation of the EIS

permits. Existing permits would likely be challenged, and new permits requested under the 'status quo' guidelines.

4) What is the Source for the 'Status Quo' Thresholds?

A dominant issue for the NOI is the definition in the NOI for the 'status quo' for impact thresholds for effects of man-made noise on marine life (actually limited in the NOI to marine mammals, and then only to cetaceans and pinipeds) (see Table 1 on page 1873).

Consider on page 1873 of the NOI:

"Alternative 1: A no action alternative would permeate the use of the existing thresholds for Level A harassment ... and Level B harassment ... that have been used for the past six years. ..."

From Table 1, the 'status quo' is listed as: 180 dBrms for Level A, and 160 dBrms for Level B for 'impulsive' noise and 120 dBrms for Level B for 'continuous' noise.

In response to a question at the Seattle meeting, Dr. Genry said that NMFS has allowed no exceptions to the 'status quo,' although he also said explosive sources are treated differently (such special treatment for explosives is not mentioned anywhere in the NOI).

In response to another question, NMFS said that a sonar ping could fall into either class (impulsive or continuous) depending on the pulse length of the ping. This is contrary to precedent and to available science.

4) Where Do We Find the Definition and Precedent for 'dBrms'?

The NOI states that it intends to cover all man-made sound sources (including in-air sources for pinipeds in air). On the other hand, the 'status quo' threshold metric is listed as 'dBrms.' This metric is in common use for airgun signals in water, but is almost never used for any other types of noise in water. Instead, SPL, intensity level, peak pressure level, energy flux density level, energy flux density level, SEL, and positive impulse are the kinds of metrics in current use in formal compliance documents.

'dBrms' is not well-defined for HESS applications, and is not generally the same as SPL (nearly always used for projector signals). For example, 'peak SPL' is not an unusual metric for explosives. But 'peak rms pressure' makes no sense. (Problems with rms pressure are well demonstrated in the recent Tolstoy et al. (2004) paper on airgun noise from the *Ewing* - in which the HESS metric and the practical measurements of rms-pressure level seem greatly (perhaps 10 dB or more) at odds.)

6) 120-dBrms as an Impact Threshold for 'Continuous' Noise

Note first that the average ambient noise level in the Western Mediterranean Sea (among other ocean regions) is often above the 120-dBrms threshold for 'continuous' noise. (That there is a thriving population of cetaceans in that area (including mysticetes) could be noted, but it is in fact not really very relevant.) Thus the threshold is, at least in some ocean regions, below ambient. Except in special cases, it is unlikely that a marine mammal could detect a 120-dB signal in a 120-dB ambient field.

As for the 120 dBrms threshold being the 'status quo' for the past six years, we note that there are a number of 'vetted' permits and/or NMFS-reviewed ESA consultations from the past several years that apply much different thresholds.

Consider also the recent permits for the very special cases of low-frequency projector sources. For both SURTASS-LFA and NPAL, the metrics and thresholds have no resemblance to the metrics and thresholds of the 'status quo' of Table 1.

7) Impact Thresholds for Airgun and Explosive Noise ('Impulsive' Noise in some cases)

The NOI does not say that explosives are not included - and explosive precedents give a number of counter-examples to the NOI claim of the 'status quo.'

In addition, air-gun-survey precedents are well established, and many permits have been issued in the past six years. The 'standard' HESS thresholds are not exactly the same as the thresholds in the NOI, but at least related. (There is a higher Level A harassment threshold for pinnipeds, at 190 dBrms). Moreover, it is very important to understand that the ensounded areas and waveforms and repetition rates for airgun surveys are unlike those for any other sound sources. The impact criteria and thresholds established by HESS are intended for use only for "typical" airgun surveys. They have not, as a rule, been applied to signals from explosions or to sonars or pile drivers or sonic booms (in water).

35

(8) Examples of Use of 120 dBrms Threshold for NMFS-Reviewed Compliance Actions in the Past Six Years (for "Continuous" Sources)?
We were unable to find any examples of the use of the 120 dBrms threshold (but there are many examples in which a different threshold was used)

36

(9) New Research Results Since Six Years Ago?
As is very evident in the April 2004 briefings of the NMFS "criteria" Panel to the MMC, there is very little, if any, new (i.e., in the past six years) empirical data to justify new (or old) criteria and thresholds for key sound sources (sonars, airguns, explosives). This is not to say that there has not been much valuable research conducted (a majority under DOD and MMS funding) on the impacts of sound on marine life.

37

(10) Explosives Included or Not?
Will explosives be treated in HES or not? If yes, what happens to all of the precedent established over the last 10 years? Is an explosive pressure wave as such an "impulse" or a "continuous" signal? How is dBrms estimated? What about explosive simulator signals, water-gun signals at range, etc.?

38

(11) References
NMFS-HQ knows all the references mentioned above. But, a specific citations can be provided if NMFS is unable to locate them.

From Katrina Keller
Date Monday, March 14, 2005 10:26 pm
To AcousticEIS.Comments@noaa.gov
Subject I.D. 060804F

Attachments [Comment Letter Submission.doc](#)

35K

Mr. Payne,

Attached you will find our comments regarding the Endangered Fish and Wildlife; Notice of Intent to Prepare an Environmental Impact Statement: I.D. 060804F. Thank you in advance for your time in reading our comments and ideas.

Sincerely,

Katrina L. Keller

<http://hmail.nmfs.noaa.gov/frame.html>

March 14, 2005

P. Michael Payne
Chief, Marine Mammal Conservation Division
Office of Protect Resources
NMFS (F/PR2)
1315 East-West Highway
Silver Spring, Maryland 20910

RE: Notice of Intent to Prepare an Environmental Impact Statement, acoustic criteria for taking under the Endangered Species Act and the Marine Mammal Protection Act

Dear Mr. Payne:

The undersigned parties intend to file detailed comments on the Notice of Intent to prepare and Environmental Impact Statement, according to the information printed in the January 11, 2005 Federal Register. This letter provides reference to general concerns that we find with the January 11, 2005 notice. We will provide more detailed information in the coming weeks.

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) has proposed replacing its current method for determining whether an anthropogenic source of sound amounts to "harassment" of marine mammals under the Marine Mammal Protection Act (MMPA). The current criteria uses a "one size fits all" policy by establishing 180 decibels (received level) as the cut off between a sound that is considered harassment under the MMPA and a sound that is not. We commend NOAA Fisheries for working to replace its current policy with a more complex one that considers several variables including the type and duration of a sound and the subject marine mammals. However, we are concerned NOAA Fisheries' proposal to revamp its acoustic criteria does not go far enough to protect marine mammals from harmful sound in several respects. Specific concerns with the Notice are detailed below.

1. Geographic/spatial component

NOAA Fisheries should analyze how the acoustic criteria could be applied in a geographic or spatial context. This concept is not without precedence for NOAA Fisheries. In the final rule for SURTASS LFA Sonar (50 CFR § 216.184), NOAA Fisheries established several "offshore areas of biological importance for marine mammals" where received levels were required to be below the minimum threshold (180 decibels). Some of these areas were only seasonal; others were in place throughout the year. Any regulations resulting from this action should similarly require lower exposures levels for sensitive areas of the marine

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environment. For example, areas of known breeding and feeding for marine mammals may be appropriate places for very conservative criteria. Marine protected areas may also be appropriate places to apply more conservative criteria.

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NOAA Fisheries should incorporate a spatial component into its range of alternatives. One option to do this may be to include "spatial sub-alternatives" to each alternative currently identified in the notice of intent. The current list of alternatives only considers different ranges of received levels of a sound, while not considering other variables such as geography. For example, within each range of received levels, NOAA Fisheries could include an alternative that would apply those criteria with no geographic restrictions (as it is currently listed now), and an alternative that would apply those criteria in manner that would be highly conservative for certain sensitive areas of the marine environment.

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2. Education

In order for the program to be effective some form of outreach and education should be initiated to inform the public and effected parties about the importance of sound to marine mammals and how anthropogenic sounds affect them. For example, the availability and use of specially made maps can guide people through restricted areas. The maps would show areas of strict acoustic criteria especially if breeding grounds and migration routes have harsher restrictions. To further illustrate the new acoustic criteria, buoys and/or monitoring devices could be set up to show boaters where noise restrictions are in place. These would be much like that of the no wake zone buoys and could incorporate a monitoring device to measure sound levels.

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To educate the public about the importance of sound in the marine environment, education exhibits should be made. At places like aquariums or large recreational harbors, small exhibits or even just posters could be displayed showing how sound is used in the ocean, what normal sounds levels are, how it can effect marine life, and the consequences of noise pollution.

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Training programs directed at the larger companies who are directly affected by the new laws should be arranged ensuring that industries like fishing understand and abide by these new laws.

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3. Monitoring

All the criteria in the world won't make any substantive difference to the marine mammals if they are being ignored. Continual monitoring and assessment of the program must be included as a part of the DEIS to understanding the potential for changes in breeding and migration patterns due to possible changes in water temperature and climate. Therefore, by observing the general patterns of affected sea life and climate characteristics, the appropriate changes can be made to the acoustic criteria maps.

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Another reason for an ongoing study would be the lack of current data on some of the marine mammals and even other potentially affected species. The continual study of marine mammals must also include the acoustic criteria of the additional species. The Federal Register notice indicated that specific information is only known about select species, and information will be generalized to broader populations, so we feel it is vital that research to include specific species be included in the DEIS. Data for terrestrial mammals has been used since marine data was not available, the validity of the data should be studied in order for proper acoustic levels to be in place. Also, the current proposed laws are based on marine mammals, but do not mention other sea life who may be more susceptible to sound. It may very well be that more conservative criteria for marine mammals would have ancillary benefits for other marine life species.

The "taking" of species must also be monitored and addressed in the DEIS. How NOAA determines if a minor taking - change in behavior, or a taking due to death occurs and the frequency as to this occurrence must be addressed in the DEIS. Recognizing that the entire ocean is too large to monitor, reference to taking and monitoring should be specifically addressed and expected government actions.

4. Data Assumptions

We are concerned about the extrapolation of data assumptions for broad functional groups. We feel there is a lack of credible data to allow the impact of the actions within this proposal to move forward as currently written. Under the scoping process, we would recommend substantially more data and information to allow for full assessment of the impact of this proposed action.

Through the DEIS, they should fully examine and calculate the risk of assumptions and the validity of extrapolations of data. Four proposed alternatives use a new matrix of categories which divides the current single set of standards into five functional hearing groups of marine creatures, and four types of sound sources. However, the criteria assume that all species in a functional hearing group have the same threshold apply to all species in the group. In reality, some species are so different from others in their functional hearing group that separate threshold criteria are appropriate for them. Actually there is lack of information on the hearing sensitivities of most marine species. Also, most data on the effects of noise on marine mammals come from mid-frequency dolphins. The results of studies on these species are applied directly to low- and high-frequency cetaceans without adjustment. Furthermore, in the absence of data for marine mammals, big jump like using terrestrial animal sensitivity levels as basis for setting standards on ocean species is used. Thus, for developing new criteria, further baseline scientific inquiry is necessary including habitat needs and identification of sensitive areas and seasons, status and distribution of populations, patterns of movements in various spatial and temporal scales, and role of sound and hearing in maintaining behaviors.

We will provide complete comments on these areas in the coming days. We understand that the agency has indicated a deadline of March 14 for comments on the Notice of Intent, and would encourage the agency to continue to accept comments, specifically with regard to obligations of public participation in the scoping process. While the agency has identified four public meetings to coincide with the scoping process, we believe that these four occasions are not sufficient given the complexity of the NOI and the broad impact of the changes proposed by the agency. We recommend more specific information be presented to the public and more opportunities to comment be provided as the EIS process moves forward.

Sincerely,

Katrina L. Keller -
Young Sung -
Kira Franz -
Lynn Pilgrim -

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From David Bain
Date Monday, March 14, 2005 10:31 pm
To AcousticEIS.Comments@noaa.gov
Subject I.D. 060804F

Friday Harbor Laboratories,
University of Washington

Michael Payne, Chief,
Marine Mammal Conservation Division,
Office of Protected Resources,
NMFS (F/PR2),
1315 East-West Highway,
Silver Spring, MD 20910
AcousticEIS.Comments@noaa.gov
RE I.D. 060804F

Dear Dr. Payne,

My comments on the proposed scope of the EIS addressing changes in noise criteria for takes follow.

NMFS' goal in setting acoustic criteria should be to set criteria such that noise below the lower threshold will not result in any takes, noise between the thresholds will result in Level B takes only, and noise above the higher threshold will result in Level A takes.

However, some of the proposed criteria go further than this, redefining what constitutes a take, apparently without regard to whether the definition is consistent with the law. As a result, it will be questionable whether the proposed alternatives can be implemented. For example, Alternative III uses the 50% behavioral avoidance level as the criterion, implying that if only 49% behavioral avoidance occurs, Level B harassment would not occur. This appears to contradict the act, which refers to "a [single?] marine mammal." Alternative VI refers to PTS onset + 6 dB as the threshold, implying that some levels above those required to cause PTS would not require a Level A permit. This redefines injury to the auditory system as not an injury. Again, this appears to contradict the letter and spirit of the act. Further, the EIS should address whether the different definitions in the MMPA and the National Defense bill merit different criteria.

NMFS should be proposing rules that clarify the connection between anthropogenic noise and behavioral and physiological responses of marine mammals. NMFS should also keep in mind the process. The MMPA recognizes the public interest in protecting marine mammals, and outlaws conduct harmful to marine mammals. However, the MMPA also recognizes that some activities that are harmful in the short-term may be beneficial in the long run, and that some activities provide sufficient benefit to the public to be allowed. When proposed conduct falls in this middle ground, a permit is required, and the public is given the opportunity to comment on whether the benefits outweigh the costs. That is, applicants have the

opportunity to ask permission before the fact rather than forgiveness after the fact. As a result, people should be advised to apply for permits in an over-protective manner. If a permit is denied, the applicant could still carry out the activity, and only face prosecution if the activity actually results in takes.

The establishment of functional hearing groups is a step in the right direction. Presumably, the number of groups will increase as knowledge improves. In addition to the physiological hearing capabilities, groups ought to be delineated on the basis of behavioral responsiveness to noise. For example, Dall's and harbor porpoises likely have similar hearing capabilities, but their behavioral tolerance of noise is different. Similarly, hearing abilities of California and Northern Sea Lions are comparable, but their behavioral tolerance of noise is different. It will be important to expand the scope of the EIS to incorporate behavioral differences.

The distinctions between single and multiple noise events, and pulse versus non-pulse noise are steps in the right direction. However, a third time frame may be worth considering in the EIS. Noise may cause short-term behavioral changes that pose little risk of immediate injury or death. However, the cumulative effect of days or weeks of modified behavior may become life threatening (e.g., if the behavior change is exclusion from a feeding ground). That is, a few minutes of exposure may only have potential for Level B effects, while weeks of exposure may have the potential for Level A effects.

The validity of assumptions needs to be considered in the EIS. For example, the assumption that criteria are truly conservative needs to be considered. Statistically significant changes in killer whale behavior at estimated received levels of around 105 dBRMS re 1 uPa have been documented. This is lower than all the alternatives except Alternative II. There are no data regarding the hearing sensitivity of mysticetes, so the assumption that they are less sensitive than odontocetes is unsupported (it seems likely that many species have comparable sensitivity at low frequencies set by ambient noise, while absolute sensitivity may differ due to differences in ambient noise at the frequency of best sensitivity). The accuracy of cross-species extrapolations also needs to be assessed. In particular, temporal integration of noise varies widely across species, meaning more caution will be needed to extrapolate effects of continuous sounds than pulses. Also, continuous sounds can resonate, providing a mechanism for unexpectedly large consequences, and this needs to be considered.

Another factor that needs to be considered is geography. The risk of driving cetaceans ashore is obviously greater in near-shore waters than in the open ocean. The potential for diving diseases like the bends is higher in deep water than in shallow water. The risk of vessel collision during a period of threshold shift may increase more in a shipping lane than in a remote area. The risk of predation due to behavioral changes or threshold shifts is probably higher where predator density is higher.

There is also a need to consider indirect effects. If prey are injured by noise, that may affect food resources available to marine mammals. Threshold shifts of only a few dB may have large effects on the volume of

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water ensouled by echolocation, leading to a large reduction in foraging efficiency. Synergistic effects of noise with other environmental stressors, such as toxins, need to be considered. Finally, the possibility of unusual consequences, such as predation on wake-riding dolphins by killer whales, should be recognized as making the boundary between Level A and Level B fuzzy rather than a bright line.

While I am advocating a protectionist approach to requiring permit applications, NMFS can take a balanced approach to actually issuing permits. E.g., while I believe the law requires a permit application when even a single individual will be taken, NMFS could issue a permit based on the number of individuals it expects to be taken, the expected severity of the takes, the stock's ability to sustain such takes, and whether the expected benefit of the work justifies takes of that magnitude. I believe this is a better approach than only requiring an application when 50% of a stock will be taken. Level A permits would be required when permanent injury is expected, whether due to the direct effects of noise or indirect effects mediated through behavioral change or increased vulnerability to predation or stranding. NMFS should be more hesitant to issue Level A permits than Level B permits. NMFS should be more hesitant to issue permits when threatened or endangered species, or depleted stocks are involved, than when healthy populations are involved. By subjecting more work to the permit process, there is more opportunity for public comment and implementation of steps to mitigate impact, even if the work is ultimately allowed to proceed. Thus the effort in the regulatory process is not wasted.

It is reasonable to ask applicants to consider the potential impact of their work on a stock-by-stock basis, addressing both the population status of the stock and its susceptibility to disturbance, rather than on the basis of acoustics alone. Requiring more detailed knowledge of biology is likely to be helpful, as understanding the biology allows the applicant to plan for mitigation at an early stage. The value of this can be seen by comparing seismic survey applications. SHIPS involved extensive biological review before the work was scheduled (for the winter of 1998 in Washington State), the survey was designed to have minimal biological impact, a permit was easily obtained, and the work was carefully monitored and carried out with no known Level A takes. In contrast, recent seismic surveys have been proposed where the biology was not considered in advance, the biological impact would have been unnecessarily large, and permits were not issued in a timely fashion, preventing the work from taking place.

Alternative I is insufficiently protective. Lower levels of noise can cause Level B behavior changes. The 180 dB criterion is based on extrapolation from terrestrial species, and the validity of the extrapolation is unknown.

Alternative II is likely to be over-protective. It would require a permit for virtually any activity that makes noise near a marine mammal, whether the noise causes any behavioral changes or not. While there would be value to NMFS having sufficient information on ambient noise levels to implement this alternative, and any noise above background may affect marine mammals through masking, much of the time natural ambient will be far above the minimum, and at these times anthropogenic noise could have

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From "Kimberly A. Amaral"
Date: Tuesday, March 15, 2005 0:01 am
To: acousticEIS.Comments@noaa.gov
Subject: I.D. 060804F

Attachments: EIS scoping for biological significance of Noise-TWC comments.doc

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March 14, 2005

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P. Michael Payne, Chief

Marine Mammal Conservation Division

Office of Protected Resources

NMFS (F/PR2)

1315 East-West Highway

Silver Spring, MD 20910

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Dear P. Michael Payne,

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On behalf of the International Wildlife Coalition I thank you for the opportunity to provide comments regarding the scope of a issues discussed in an upcoming NMFS Draft Environmental Impact Statement (DEIS) analyzing the potential impacts of applying new criteria in guidelines to determine what constitutes a "take" of a marine mammal under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). While the International Wildlife Coalition (IWC) applauds efforts to further understand the impacts of noise on marine mammals, including the "biological significance" of noise impacts, we feel that the alternatives proposed in the EIS scope contain assumptions that exceed the current knowledge we have regarding marine mammals and noise.

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While there may be enough confirmed recordings of marine mammal vocalizations to accurately address the acoustic repertoire of many marine mammal species (and thus place them into functional hearing groups discussed), frequency range is not the only factor to consider when considering noise impacts on marine mammals. Duration and intensity of sound may also impact marine mammal behavioral and physiological response (Yack, et al., 2004). Additionally, the acoustic criterion provided in Tables one and two of the Federal Register notice (F.R. Doc. 05-525) address only sound intensity, ranging from 120-221 dB_{re: 1µPa}, and not frequency ranges of

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no effect at all. Depending on how the "highest average" is defined, it may or may not have anything to do with the level that causes injury. Nevertheless, this is the only alternative under consideration that would require a permit for all activities that result in takes.

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Alternatives III-VI are insufficiently protective. As mentioned above, 105 dB is sufficient to cause behavioral changes, and that is far below the 160 dB and above levels envisioned in these alternatives. The criterion for Level A is 155-165 dB to 181-191 dB above threshold for mid-frequency cetaceans. A noise the same number of dB above threshold for a human would be far above the pain threshold. It is extremely difficult to produce a received level above 220 dB more than 10 meters from a source in water, meaning Alternative VI essentially defines Level A harassment as an impossibility.

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In summary, while the Federal Register notice identifies some good points to consider in the development of new criteria for noise, there are additional complexities that need to be considered. It is important that NMFS develop regulations that are consistent with the acts they are intended to implement. When considering the implications of setting criteria, it is important to keep in mind that the permit process can be used to restructure work to minimize incidental takes while allowing the applicant's objectives to be achieved, rather than simply as a blunt tool to allow work to proceed or not.

Thank you for your consideration of these issues.

Sincerely,

Dr. David E. Bain,
Affiliate Assistant Professor of Psychology

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noise, nor duration. There is no clear indication in the scoping presented here that these elements will be adequately addressed.

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The IWC also has concerns about assumptions regarding hearing and behavioral/physiological responses of marine mammals for which little research exists. The scoping document presented here states that "the criteria assume that all species in a function hearing group have the same threshold apply to all species in the group," and that "in the absence of data for marine mammals, in some cases data from terrestrial mammals are used in determining exposure criteria." This transference of knowledge is considered acceptable for injury, as "because the anatomy of the inner ear of all mammals is extremely similar." First of all, the terrestrial mammal ear is quite different structurally from marine mammal ears. The outer ear in marine mammals contains no pinnae and sound is conducted to the ear via conduction along the bone. Furthermore, the malleus is not connected to the tympanic membrane, but is attached hard and fast to the bulla (Au, 1993). Additionally, a recent report by the National Research Council (2005) states that other, nonauditory effects of sound may impact animals, including rectified diffusion. Rectified diffusion is a physical phenomenon that leads to the growth of microscopic nuclei in the presence of high-intensity sound, and might be a possible mechanism of nonauditory acoustic trauma in human divers and marine mammals, leading to injury or death (NRC, 2005).

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Regarding the specific alternatives provided in the scoping document, Alternative II is presented as being based on conservative behavioral response data, with Level A harassment occurring if received noise from a human source exceeded the highest average ambient noise level in the area of operation. However, this does not take into account the possibility of shifting baselines for ambient noise. For instance, increased vessel traffic in an area may be the source of ambient noise (depending on whether ambient noise is defined as natural background noise, or ever-present noise), which alone may be loud enough to disturb animals. Additionally, as noise activities occur in an area, these may contribute to ambient noise, thus having a cumulative impact on marine mammals. Therefore, a more defined minimum "ambient noise level" is necessary for Alternative II.

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Alternatives VI is also troubling, as includes a permanent threshold shift (PTS) onset for Level B criterion of harassment. This is simply unacceptable. PTS constitutes actual injury/permanent damage to the marine mammal ear, and Level B harassment is reserved not for an act that "injures or has the significant potential to injure" (which is Level A harassment), but rather "disturbs or is likely to disturb a marine mammal." Injury to an animal—in particular, permanent injury to a marine mammal—should not constitute Level B harassment.

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Alternatives III-V contain acoustic criterion primarily focused on temporary threshold shifts (TTS) or permanent threshold shifts. These are both physiological responses of marine mammals to noise, and does not address behavioral responses (with the exception of Level B criterion for Alternative III, which indicates 50% behavioral avoidance). The MMPA defines harassment as "... any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, feeding, or sheltering [Level B harassment]." Simply indicating when a TTS or PTS occurs in the marine mammal ear does not

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take into account behavioral changes that may impact migration, breathing, nursing, feeding or sheltering. For instance, one study has found avoidance of sound sources at several hundred to thousands of meters (Goold, 1996). Other playback experiments have found that humpback whales will sing louder with a louder playback (Fristrup, et al., 2003).

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Additionally, other physiological impacts of noise on marine mammals occur besides TTS and PTS, including the impact of stress. Stress in marine mammals may be studied in a variety of ways, including the use of glucocorticoid and other serum hormone concentrations to assess stress. The IWC agrees with the NRC that further research into this area to develop validated, calibrated curves for these indicators of stress in marine mammals (NRC 2005).

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Finally, the scoping document presented here depicts only single-species criterion, while multiple species in various frequency ranges are very likely to be found in the same areas at the same time of year (i.e., grey whales and Pacific white-skid dolphins). Thus, these criterion, if adopted, should still be accompanied by careful observation, and pull from various databases regarding marine mammal distribution and abundance, including those being recommended by the NRC (Recommendation 3, 2005).

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The IWC encourages further research regarding the impacts of noise on marine mammals. However, the scoping document presented here makes many assumptions regarding research that does not yet exist or is in its infancy, and thus requires that a precautionary approach be continued before applying these assumptions to the real-world.

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Sincerely,

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Kimberly Amaral
Marine Mammal Program Consultant
International Wildlife Coalition

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Tyack, P., J. Gordon and D. Thompson. 2004. Controlled Exposure Experiments to Determine the Effects of Noise on Large Marine Mammals. *Marine Technology Society Journal* 37(4): 41-53.

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March 14, 2005

P. Michael Payne, Chief
Marine Mammal Conservation Division
Office of Protected Resources
NMFS (F/PR2)
1315 East-West Highway
Silver Spring, MD 20910

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The IWC also has concerns about assumptions regarding hearing and behavioral/physiological responses of marine mammals for which little research exists. The scoping document presented here states that "the criteria assume that all species in a function hearing group have the same threshold apply to all species in the group," and that "in the absence of data for marine mammals, in some cases data from terrestrial mammals are used in determining exposure criteria." This transference of knowledge is considered acceptable for injury, as "because the anatomy of the inner ear of all mammals is extremely similar." First of all, the terrestrial mammal ear is quite different structurally from marine mammal ears. The outer ear in marine mammals contains no pinnae and sound is conducted to the ear via conduction along the bone. Furthermore, the malleus is not connected to the tympanic membrane, but is attached hard and fast to the bulla (Au, 1993). Additionally, a recent report by the National Research Council (2005)

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Additionally, other physiological impacts of noise on marine mammals occur besides TTS and PTS, including the impact of stress. Stress in marine mammals may be studied in a variety of ways, including the use of glucocorticoid and other serum hormone concentrations to assess stress. The IWC agrees with the NRC that further research into

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Finally, the scoping document presented here depicts only single-species criterion, while multiple species in various frequency ranges are very likely to be found in the same areas at the same time of year (i.e., grey whales and Pacific white-sided dolphins). Thus, these criterion, if adopted, should still be accompanied by careful observation, and pull from various databases regarding marine mammal distribution and abundance, including those being recommended by the NRC (Recommendation 3, 2005).

The IWC encourages further research regarding the impacts of noise on marine mammals. However, the scoping document presented here makes many assumptions regarding research that does not yet exist or is in its infancy, and thus requires that a precautionary approach be continued before applying these assumptions to the real-world.

Sincerely,

Kimberly Amaral
Marine Mammal Program Consultant
International Wildlife Coalition

References:

Au, Whitlow. 1993. *The Sonar of Dolphins*. Springer-Verlag, 277pp.

Fristrup, K.M., L.T. Hatch and C. W. Clark. 2003. Variation in humpback whale (*Megaptera novaeangliae*) song length in relation to low-frequency sound broadcasts. *Journal of the Acoustical Society of America* 113(6): 3411-3424.

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Tyack, P., J. Gordon and D. Thompson. 2004. Controlled Exposure Experiments to Determine the Effects of Noise on Large Marine Mammals. *Marine Technology Society Journal* 37(4): 41-53.

From "FAXCOM Fax Server"
 Date Wednesday, March 16, 2005 9:18 am
 To "AcousticEIS.Comments@noaa.gov" <AcousticEIS.Comments@noaa.gov>
 Subject FAX RX OK
 Attachments [HOFAXCQM_0503161418190393.pdf](#)

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Maritime Department



March 10, 2005

301-427-2581
Facsimile Transmittal
 To P. Michael Payne, Chief
 Dept./Co. Marine Mammal Conservation Division
 From Deborah Hadden, Deputy Port
 Date 3/10/05 Director, Properties & Transportation
3 pages (including coversheet)

Mr. P. Michael Payne
 Chief, Marine Mammal Conservation Division
 Office of Protected Resources
 National Marine Fisheries Service (R/P/R2)
 1315 East-West Highway
 Silver Spring, MD 20910

Re: Proposed EIS on Acoustic Guidelines for the Protection of Marine Mammals
 ID No. 060804F

Dear Mr. Payne:

The Massachusetts Port Authority (Massport) has attended the public meeting in Boston and reviewed the January 11, 2005 Federal Register Notice related to the National Marine Fisheries Service's (NMFS's) intention to prepare an Environmental Impact Statement (EIS) to analyze the potential impacts of proposed acoustic guidelines for the protection of marine mammals (ID No. 060804F). This will undoubtedly be a challenging endeavor, and we commend NMFS for initiating this effort. As you requested, we respectfully provide the following questions and issues that we believe need to be addressed in the EIS:

- The EIS needs to provide sufficient contextual information and documentation to allow reviewers to evaluate the implications for various user groups and marine mammal types. 1
- The EIS must clearly state what uses and user groups will be subject to the proposed guidelines, and what uses and user groups will be exempt. 2
- How will the guidelines differentiate between stationary and mobile/transient (i.e., slips) sources? 3
- Does NMFS intend to issue permits to all vessels based on ship type, noise emitted and marine mammals along typical or potential travel lanes, and if so how would this be implemented and enforced? If not, how would the guidelines apply to ships? 4
- The EIS should evaluate existing and potential technologies that could attenuate or otherwise mitigate underway noise sources, including noise from vessels and marine construction activities. 5

NOTES

Any questions, please call Meg Shannon
at 617-946-4435

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Mr. P. Michael Payne
March 10, 2005
Page 2

- The guidelines must allow for consideration of acoustic emissions that result in a net benefit to marine mammals. For example, as you know, technologies are being evaluated that would help to minimize interactions between ships and the North Atlantic Right Whale and other whale species. These technologies, some of which emit acoustic signals, may be the key to reducing whale mortalities from ship strikes. The guidelines should allow for development and use of such technologies if it can be demonstrated that the potential marine mammal benefits of the technology outweigh the impacts.
- The EIS must be based on sound science and thoroughly assess the economic impacts of the proposed guidelines.

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Thank you for this opportunity to provide input into the EIS scope, and we look forward to reviewing the Draft EIS once it is available.

Sincerely,

 Michael A. Leone
 Port Director

March 4, 2005

Michael Payne,
 Chief, Marine Mammal Conservation Division,
 Office of Protected Resources, NMFS (FPR2),
 1315 East-West Highway,
 Silver Spring, MD 20910

RE: LD 060804P

Dear Mr. Payne,

I am writing you as a deeply concerned citizen of this planet. Along with my voice, please see that I am not the only one concerned (see enclosed documents). Over 7000 individuals from around the world would like you and your colleagues to seriously consider your responsibility in maintaining LIFE in our oceans. These individuals, in only a matter of weeks, have been made aware of and have come forward for this concern as exigencies to this letter. Imagine how many more people are learning the TRUTHS every day about our oceans - the ripple effect has begun!

As you prepare the EIS to analyze the environmental impacts of several approaches to creating new guidelines to determine what constitutes a "take" of a marine mammal under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) as a result of exposure to anthropogenic noise in the marine environment, please be very AWARE of several issues that WE expect to be thoroughly considered and addressed.

One thousand and two people have come forward to let you and NMFS know that they want the following issues and comments to be fully addressed:

The Issues and Comments:

- Since 1997 when NMFS started using 180 dB SPL, the following strandings coincided with the use of sonar or seismic airguns have occurred: the U.S. Virgin Islands (1998), the Bahamas (2000), Madeira (2000), the Canary Islands (2002 and 2004), Baja California (2002) and the NW coast of the United States (2003);
- The only scientific guidance for human divers exposed to noise is a level of 145 dB SPL;
- According to the US Navy in their investigation into the Bahamas stranding event, the level of noise that was reported to and died was 138 dB SPL;
- How will the evidence and resultant data obtained after studying these stranding events be analyzed and used in determining the criteria and the potential impacts of each proposed alternative?
- Most of the scientists that are advising NMFS are navy scientists, navy contractors, or have received funding from the Office of Naval Research.
- Will the makeup of the panel of scientists who are advising on the criteria be addressed, including their current and past affiliations and their funding backgrounds?

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2

03/16/2005 09:18AM

- The approach used to determine the new criteria disregards the long term effects of noise, does not account for noise damage to non-hearing organs, and does not take into account recent findings that suggest that certain whales get the "bends" and die as a result of rising too quickly in response to noise levels just over background.

Will there be an assessment of the long term effects and non-hearing organ effects of anthropogenic noise on marine mammals and other marine creatures?

The noise response criteria that NMFS proposed are based on a limited experimental data collected from a limited number of individuals of a limited number of species in an unnatural environment. To supplement this data, data from terrestrial animals (including chinchillas) have been used. There have been extrapolated to fill in the gaps for certain groups of marine mammals, leading to no data.

The development of the criteria calls for a large amount of extrapolation in the analysis of anthropogenic noise. How will this be reconciled?

The criteria do not take into account differences between different individuals within different individuals, at different ages, and in different and constantly changing marine environments such as near-shore, near, warm and frigid water, in deep canyons, in high salinity.

What scientific methods used to account for the constantly changing and individual differences of the marine environment in the effect on noise characteristics?

Strong cautionary statements about the impacts of noise on marine mammals have been issued by the European Parliament, the International Whaling Commission; the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS); the Spanish Government; the Canary Islands; and the World Conservation Union.

Will the process address the recent strong cautionary statements that have been made by internationally recognized bodies outside of the US with regard to anthropogenic noise? Such bodies include the European Parliament, the International Whaling Commission, the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS), and the World Conservation Union.

It is impossible for individuals who do not live in this planet with you and your colleagues. The responsibility for protecting will not be in this process. NMFS cannot say that their responsibility will just "move away" after this is all said and done. It is not fair to place the responsibility on individuals just "move away" from extreme noise. It is not fair to place the responsibility on individuals just "move away" from extreme noise. It is not fair to place the responsibility on individuals just "move away" from extreme noise.

Global partners, members of Global Marine Arts Canada, and citizens of the world who are concerned about the impacts of noise on marine mammals and other marine creatures.

Suzanna Duff and ALL 1002 signatories

"A scientist who fails to assume social responsibility, the feedback from all other members of his species, is not taking the responsibility of being a human being beyond a limited self-serving role in society." John C. Lilly



TOTAL:

1002
SIGNATORIES

WHO WILL BE
WATCHING!

TOTAL:

670
SIGNATORIES

FROM LOCAL
PETITION



Classical

Martial Arts

Canada



PETITION TO ADDRESS CONCERNS OF REVISING OCEAN NOISE LEVEL CRITERIA UPWARDS

The below signatories request that The National Marine Fisheries Service NMFS fully address each of the following comments in preparation of the Environmental Impact Assessment to analyze the potential impacts of applying a new criteria in guidelines to determine what constitutes a "take" of a marine mammal under the Marine Mammal Protection Act and Endangered Species Act as a result of exposure to anthropogenic noise in the marine environment:

- 1) There have been numerous marine mammal stranding events that have occurred since NMFS adopted the use of the current noise criteria in 1967. How will the evidence and resultant data obtained after studying these stranding events be assimilated and used in determining the criteria and the potential impacts of each proposed alternative?
- 2) Will the makeup of the panel of scientists who are advising on the criteria be addressed, including their current and past affiliations and their funding backgrounds?
- 3) The development of the criteria calls for a large amount of extrapolation and the use of very limited data sets. How will this be reconciled?
- 4) Will there be an assessment of the long term effects and non-hearing organ effects of anthropogenic noise on marine mammals and other marine organisms?
- 5) What are the methods used to account for the constantly changing and regional differences of the ocean environment and its effect on noise characteristics?
- 6) Will the process address the recent strong cautionary statements that have been made by internationally recognized bodies outside of the US with regard to anthropogenic sound? Such bodies include: the European Parliament; the International Whaling Commission; the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS); and the World Conservation Union?

We, the undersigned, strongly object to revising the noise criteria upward and expect the above comments be addressed thoroughly. Moreover, we cannot accept the current level of 180dB as "safe" (or anything greater) until greater assessment is completed and evaluated. Until then, all deployment of high intensity sonars and seismic exploration should be stopped.

First Name Last Name Address City/Postal Code Country Signature

1. Richard Beemer

2. _____

3. _____

4. Wallace Platt

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

The signed petition will be submitted February 28, 2005 to Michael Payne, Chief, Marine Mammal Conservation Division, Office of Protected Resources, NMFS (919) 5118 East-West Highway, Silver Spring, MD 20910 Email: justus@dmr.commerce.state.gov F:(301) 427-2541 Deadline for Written Comments is March 4, 2005.

Classical Martial Arts Canada



TOTAL:

332
SIGNATORIES

FROM
WORLD WIDE WEB
ONLINE PETITION

THE BELOW SIGNATORIES REQUEST that NMFS fully address the issues outlined above.

It is not acceptable to increase a noise level criteria which has already demonstrated an increasing concern for the welfare of the marine life existing in our oceans today. Any change to the criteria should be made to LOWER IT.

Signature #1 Signer's Name: Susanna Duft
Country: CA State:
Reason for signing Petition: Too much harm has already taken place to our whales and dolphins due to harmful ocean noise - This can be stopped if WE, the CARETAKERS OF OUR PLANET, speak up and DO SOMETHING NOW!

Signature #2 Signer's Name: Lisa Costello
Country: CA State: NA
Reason for signing Petition: I firmly believe, that all Marine Mammals have just as much right to LIVE & BREED, freely in our world's oceans and seas, it is such a CRIME that they are treated so unfairly, for so many reasons, such as being put on display, for human pleasures (this is just wrong!!!!) Leave them alone!!!!

Signature #3 Signer's Name: Alf Crisp
Country: CA State:
Reason for signing Petition: Planet earth and its inhabitants are all connected. We all live on a delicate balance. If we hurt one part of that balance, then our children and grandchildren will pay for it down the road. I am signing this petition because I am sick and tired of hearing about the unnecessary deaths of whales and dolphins due to sonar and seismic tests. Please ensure that all kinds of animals will be able to see dolphins in the wild when they become adults. Pass this petition on to all those you know.

Signature #4 Signer's Name: Debbie Thurston
Country: CA State:
Reason for signing Petition: All of wildlife should be taken care of.

Signature #5 Signer's Name: Sharon Russell
Country: CA State: NA
Reason for signing Petition: We are all one. Everyone. Everything has an impact on the Earth, on each of us. Have the marine animals, who are sensitive to this environment, taken on the back of how we are doing to ourselves, the animals, nature, the land etc so that we will become a better wake up? If it's doing this to them what is it doing to everyone and everything else? Sound and vibrations are so subtle and yet so powerful both positively and negatively. We need to understand it better. I want to thank the marine life for showing us what is going on out there. Now let's take it to heart and take action in finding a positive solution for all.

Signature #6 Signer's Name: Ray Novokowsky
Country: CA State:
Reason for signing Petition: Our ecosystem is a delicate balance of energies and forces. We have a choice and responsibility to respect all life in all ways possible. Certainly the threshold of noise should not be in excess of that which is acceptable to human divers. I would also wonder what the threshold of noise is on less complex entities without comparable ability to communicate from their natural habitat.

Signature #36 Signer's Name: Katharina Heyer
Country: CH State:
Reason for signing Petition: to help protect our oceans

Signature #37 Signer's Name: Michael Stocker
Country: US State: CA
Reason for signing Petition: I have been working on ocean noise issues for 15 years. (<http://www.seafloor.org>) Over that time I have watched NMFS and NOAA pander to the US Navy and the Petroleum industry. We now know for sure that the oceans are in bad shape, and that ocean noise is one of the many culprits. In light of this it is reckless and irresponsible to weaken the MMPA, the ESA and any other laws protecting the marine biota.

Signature #38 Signer's Name: Robert Stage
Country: US State: CA
Reason for signing Petition: Because it is right

Signature #39 Signer's Name: Maria Filidel
Country: US State: CA
Reason for signing Petition: Someone needs to protect the marine mammals.

Signature #40 Signer's Name: Ileana Birely
Country: US State: CA
Reason for signing Petition: Please honor the animals of the Sea and stop the ocean noise!!!!

Signature #41 Signer's Name: Donna W. Campbell
Country: US State: CA
Reason for signing Petition: they are valuable creatures - they deserve to have their world left undisturbed - there is NO justification for the obscene noise we are subjecting them to - STOP IT NOW!

Signature #42 Signer's Name: Jan Cecil
Country: US State: CA
Reason for signing Petition: I feel very strongly about this issue. For humans to interfere with such a critical aspect of marine environment - without understanding the impact on known species or the full range of organisms affected - is foolish, cruel and suicidal.

Signature #43 Signer's Name: Markus Enderle
Country: DE State:
Reason for signing Petition: The protection of our environment is a global problem which needs global attention. Moreover I am an idealist: so I just have to do it!

Signature #44 Signer's Name: Diana Mann
Country: US State: CA
Reason for signing Petition: Nothing is more precious than life on this planet. Everything that can be done to protect each and every species.

Signature #16 Signer's Name: Elliot Crown
Country: US State: NY
Reason for signing Petition: The great whales are facing extinction by human agency. They must be protected to ensure their survival and the diversity of life.

Signature #17 Signer's Name: noelle elia
Country: CA State:
Reason for signing Petition: because i feel strongly about other species' happiness and survival

Signature #18 Signer's Name: anela gluzko
Country: CA State:
Reason for signing Petition: the great whales need protection, the creator put the whale on earth just as man and woman was put here to, should i be extinct as well.

Signature #19 Signer's Name: william mazzamora
Country: US State: CA
Reason for signing Petition: I am outraged the US Govt/Military pays no attention to court rulings and the huge public outcry against "ocean noise"

Signature #20 Signer's Name: kiley blackman
Country: US State: NY
Reason for signing Petition: I believe ocean noise is harmful to marine mammals, and will ultimately effect other life forms as well.

Signature #21 Signer's Name: Paradise Newland
Country: US State: HI
Reason for signing Petition: In the Spirit of Aloha... It is time we recognize the Cetaceans as the sentient, intelligent cultures they are. Join us in the Cetacean Commonwealth as we seek to secure their rights as a People. See www.planetpuna.com.

Signature #22 Signer's Name: Susie Faver
Country: CA State:
Reason for signing Petition: Its time to think about the environment.

Signature #23 Signer's Name: Joseph chamberlin
Country: US State: NY
Reason for signing Petition: Grow up! As a child I pulled the wings off flies and burnt ants with a magnifying glass. You're still sonicing whales? Oh, please.

Signature #24 Signer's Name: Sandy Borelli
Country: US State: OH
Reason for signing Petition: Because I care about animal welfare. They cannot stop this themselves so we must.

Signature #25 Signer's Name: Julie Serrano
Country: US State: NY
Reason for signing Petition: I am a mother and I cannot fully think about the future generations.

Signature #54 Signer's Name: Penelope Smith
Country: US State: CA
Reason for signing Petition: To protect the ocean inhabitants from assault with high powered unnatural noise pollution.

Signature #55 Signer's Name: Tilen Geov
Country: SI State:
Reason for signing Petition: I understand the problem of noise pollution and the dangers that noise can pose.

Signature #56 Signer's Name: Pamela Geller
Country: US State: CA
Reason for signing Petition: to increase awareness and action regarding marine life and well-being

Signature #57 Signer's Name: Danni Lynn
Country: US State: CA
Reason for signing Petition: All creatures have a right to live on this planet - it is our job to protect the rights of those who cannot do it for themselves, whether human or animal.

Signature #58 Signer's Name: John Ferris
Country: US State: CA
Reason for signing Petition: I am concerned about sea mammals and how military sonar is affecting their behavior and lives to the point of self-harm and suicide.

Signature #59 Signer's Name: Jodi Embury
Country: US State: CA
Reason for signing Petition: When there is a party and the noise level is too high for the neighbors, the police respond and the party is notified of the problem. The position is the same if not worse.

Signature #60 Signer's Name: Roman LoBianco
Country: US State: CA
Reason for signing Petition: The amount of evidence amassed on sonar damage to marine species is now unrefutable. No government/corporate agenda is worth sacrificing the health of our oceans. Moreover, the ESA states we have no right to take a species. Since the NOAA Administration is required by law to be a member of the ESA Committee, NOAA knows better and should be strictly enforcing that law - even when our own military is breaking it.

Signature #61 Signer's Name: Charles Shelton
Country: US State: VA
Reason for signing Petition: PLEASE STOP THE KILLING!

Signature #62 Signer's Name: Michael Tempko
Country: US State: WA
Reason for signing Petition: We have a responsibility to respect all forms of life on this planet. I realize when we have solid evidence that we are failing to live up to this responsibility, we should stop our destructive actions.

Signature #71 Signer's Name: Julie Perkins
Country: US State: CA

Reason for signing Petition: Dear NMFS - Please take your scientific duty seriously and use caution and action to avoid rending the web of life in the ocean even further, with the obviously disruptive effects of sonar waves that cause damage to fish and mammal organs- these effects are real and irreversible. Please be the vanguard to promote protection and awareness for all of us. We cannot afford to loose any more marine life in this manner. Thank you very much.

Signature #72 Signer's Name: Guy Kelley
Country: US State: CA

Reason for signing Petition: Our environment must receive more respect, appreciation, and protection - for the benefit of us, our children and the earth.

Signature #73 Signer's Name: Suelien Primost
Country: US State: CA

Reason for signing Petition: We must protect marine mammals from the unconscionable assault and noise barrage that threatens their very lives and habitats.

Signature #74 Signer's Name: Christian Heath
Country: US State: CA

Reason for signing Petition: To protect the oceans and the creatures that live there from entirely needless torture

Signature #75 Signer's Name: Bea Benjamin
Country: US State: CA

Reason for signing Petition: because the marine mammals can not.

Signature #76 Signer's Name: Michelle Waters
Country: US State: CA

Reason for signing Petition: Because NMFS is supposed to be protecting our oceans and the life within them.

Signature #77 Signer's Name: Sara schoorl
Country: US State: CA

Reason for signing Petition: Ocean noise is killing our sea beings. We must protect all life otherwise we ultimately jeopardize our own.

Signature #78 Signer's Name: Tom Geha
Country: US State: WA

Reason for signing Petition: I am concerned about the cavalier way sonar is being used in the oceans to the obvious detriment of marine life, and what this is doing to the planet and our consciousness.

Signature #79 Signer's Name: Paul Arons
Country: US State: WA

Reason for signing Petition: I live in an area frequented by Orcas and other marine mammals. Ocean noise is obviously harmful to animals that depend on their sense of sound for survival.

step forward with a plan that addresses all issues around ocean "sonar" and a mechanism to protect all species so adversely impacted by unnatural ocean noise. We can't let the Bush Administration hide behind the "national security" issue to avoid the consequences of unregulated ocean noise pollution.

Signature #106 Signer's Name: Louise Stevenson
Country: US State: TX

Reason for signing Petition: Because this is an important cause which the public is not aware of and our government is trying to take advantage of our ignorance.

Signature #107 Signer's Name: Michelle Ferro
Country: US State: CA

Reason for signing Petition: Support of marine mammals.

Signature #108 Signer's Name: Leeda Connes
Country: US State: CA

Reason for signing Petition: I am a college undergrad studying marine bioacoustics and I have seen first hand and time again that human noise indeed harms marine mammals and effects ALL marine life. The more we disrupt the oceans, the less of a chance our grandchildren have to live. I also think it is high time humans found a more mature way of solving conflict than parading around in submarines and war machines, which would take care of the need for sonar in the first place.

Signature #109 Signer's Name: Matthew Schneider
Country: US State: CA

Reason for signing Petition: Because it is necessary.

Signature #110 Signer's Name: Patricia Bradford
Country: US State: CA

Reason for signing Petition: I believe we have a strict responsibility not to harm marine animals with sonar.

Signature #111 Signer's Name: selise kelloway
Country: AU State:

Reason for signing Petition: This kind of thing cannot be tolerated.

Signature #112 Signer's Name: sofia dumltru
Country: US State: CA

Reason for signing Petition: We must must implement regulations that protect our ocean life.

Signature #113 Signer's Name: Neil Herring
Country: US State: CA

Reason for signing Petition: because I agree with it

Signature #114 Signer's Name: Susan Rodriguez
Country: US State: CA

Reason for signing Petition: Compelled to protect the mammals.

Signature #90 Signer's Name: Barbara Connes
Country: US State: CA

Reason for signing Petition: the ocean and its creatures need our protection

Signature #91 Signer's Name: Lynda Winslow
Country: US State: CA

Reason for signing Petition: We live on an ocean planet. Ocean noise has a devastating effect on marine life. This is an environment especially susceptible to pollution from sound. Sound carries much further in water; these creatures depend on their hearing and sound-making abilities to survive.

Signature #92 Signer's Name: Holly Chere Williams
Country: US State: CA

Reason for signing Petition: This cruelty is another unnecessary action lacking the god-given humanity we've been given to use.

Signature #93 Signer's Name: Maggie Rufe
Country: US State: CA

Reason for signing Petition: I think we have enough cases of the death and stranding of marine mammals for our those entrusted with protecting the seas and its creatures to take action.

Signature #94 Signer's Name: Christian Boucher
Country: CA State:

Reason for signing Petition: I believe our survival as specie relies on the survival of the others species and the protection of the nature

Signature #95 Signer's Name: Bonnie Phelps
Country: US State: CA

Reason for signing Petition: If we cannot respect and care for the innocent creatures of our beautiful world, that provide immeasurable balance and grace, then what shall become of us, the human race?

Signature #96 Signer's Name: Lynda Martyn
Country: US State: CA

Reason for signing Petition: I have swum with schools of wild dolphin in the ocean several times and they are truly remarkable, highly intelligent animals who have an amazing ability to communicate. The current level of noise is causing death and substantial damages to marine mammals. We need to reduce not increase the noise we allow in our oceans. The oceans belong to everyone and whatever we are doing right now is just not morally right.

Signature #97 Signer's Name: Norma Bailey
Country: US State: CA

Reason for signing Petition: As a Navy vet I know of alot of ways that we are polluting the ocean. What I have seen with my own eyes has made me beg my family not to eat anything that comes from the ocean. Destroying sea life from life threatening noise is the very least we can do.

Signature #124 Signer's Name: Julie Brod
Country: US State: CA

Reason for signing Petition: Our oceans are a delicate ecosystem, every part being vital. We rely on our oceans for our own existence. Future generations have a right and need to experience and enjoy seeing whales and other marine organisms. Our navies don't need this technology to keep us safe, these noises attract attention. We fail as humans when we can't be humane and allow animals a peaceful and healthy existence. Every being has a right to it's life.

Signature #125 Signer's Name: Ann Christensen
Country: US State: ID

Reason for signing Petition: It has become evident that ocean noise is deadly to marine mammals and we must take the responsibility of stopping this treat to their right to exist. I do not want to live in a world without these magnificent animals.

Signature #126 Signer's Name: Roy Tuckman
Country: US State: CA

Reason for signing Petition: The U.S. Navy is supposed to be defending us ON the oceans, not making war AGAINST the oceans.

Signature #127 Signer's Name: eliza holmes
Country: US State: CA

Reason for signing Petition: There is much evidence that even lower levels of noise harms and kills whales, dolphins and other marine life. There is no excuse (or necessity) for humans to knowingly inflict this cruel treatment on other species. It is totally irresponsible, disrespectful and inhumane (it is our responsibility to give very high priority to protecting the oceans and marine life--and, ultimately, ourselves.

Signature #128 Signer's Name: Lauren Verran
Country: US State: PA

Reason for signing Petition: Because the marine mammals need protection.

Signature #129 Signer's Name: Tom Tauszig
Country: US State: CA

Reason for signing Petition: Everybody needs to sign it!

Signature #130 Signer's Name: Roger Hallsten
Country: US State: CA

Reason for signing Petition: Marine mammals evolved to hear a natural range of sounds, NOT sound many orders of magnitude greater. By the precautionary principle, the burden of proof should be on the government to demonstrate (not assume) tremendous sound pressures are safe.

Signature #131 Signer's Name: Sigrid Lueber
Country: CH State:

Reason for signing Petition: Over the past half-century, human activity in the sea has increased dramatically. The use of acoustic technology for oil and gas exploration, military exercises, commercial fishing, as well as shipping, and other purposes has contributed to a rise in acoustic energy levels throughout the world's oceans. Growing numbers of marine mammals are dying from the effects of human-made sounds. The use of acoustic technology to locate and track marine mammals is a critical tool for their survival. It is our responsibility to ensure that this technology is used in a way that does not harm the animals.

Signature #139 Signer's Name: Lucia Tieni
Country: CH State:
Reason for signing Petition: -

Signature #140 Signer's Name: S. K&I
Country: CH State:
Reason for signing Petition: We are not the only living beings on this planet. Please think about the beautiful creatures which have around us. It is necessary to protect and respect them highly instead of doing harm to them.

Signature #141 Signer's Name: Brenda Walker
Country: CA State:
Reason for signing Petition: To protect marine mammals from ocean noise

Signature #142 Signer's Name: Janet Lowenthal
Country: US State: MD
Reason for signing Petition: I believe in protecting and respecting all life.

Signature #143 Signer's Name: Susan Kilian
Country: US State: FL
Reason for signing Petition: It's the right thing to do.

Signature #144 Signer's Name: christina wether
Country: CA State:
Reason for signing Petition: What more can we do to help our environment anyway? How completely unnecessary!!!

Signature #145 Signer's Name: Gurradatta Shah
Country: US State: CA
Reason for signing Petition: To protect the sea mammal from harmful sonar testing.

Signature #146 Signer's Name: Cheryl Toth
Country: US State: AZ
Reason for signing Petition: The military has no right to use technology that in ANYWAY, harms marine life. There is something wrong with a society who puts national security ahead of sentient life.

Signature #147 Signer's Name: Kristl Debanham
Country: US State: CA
Reason for signing Petition: We are all part of the web of life. What we do to the least of these our brothers and sisters we are doing to ourselves.

Signature #148 Signer's Name: B. Whitestone
Country: CA State: CA
Reason for signing Petition: To stop one more unconscious act of man from making a harmful impact on life.

Signature #149 Signer's Name: Leah Glor
Country: CA State: CA
Reason for signing Petition: To stop the destruction of marine mammals.

Signature #158 Signer's Name: Amma Ra
Country: GB State: NA
Reason for signing Petition: Marine Mammals are essential to the balance of the oceans. They are our care. So we must protect them, and everyone knows that these tests causing them to die.

Signature #159 Signer's Name: Dan Brook
Country: US State: CA
Reason for signing Petition: <http://www.brook.com/vsg>

Signature #160 Signer's Name: Robert N. Christensen
Country: US State: CA
Reason for signing Petition: I sign this proposal to add my voice to say that the current levels are already too high and must not be raised. Please lower them to a more civilized, non-harming level.

Signature #161 Signer's Name: Sandra Hill
Country: US State: CA
Reason for signing Petition: The oceans belong to the inhabitants and to use this harmful technology there is paramount to going into your neighbor's home and assaulting them.

Signature #162 Signer's Name: saskja achilles
Country: US State: CA
Reason for signing Petition: if the creatures in the oceans die, the oceans die. if the oceans die, humankind dies.

Signature #163 Signer's Name: Audrey Delon
Country: BE State: CA
Reason for signing Petition: We can learn so much from these angels of the sea. They have changed my life. This is my way to do something back for them.

Signature #164 Signer's Name: Pamela Strong
Country: US State: CA
Reason for signing Petition: Several years ago I learned that U.S. Navy sonar devices in the oceans were destroying the eardrums on whales - which disables them from receiving communications from other whales, an ability basic to their survival. Inflicting this kind of pain and suffering on harmless animals is so unacceptable, if we are to call ourselves "humans," indicating that we possess humanity and compassion, we just cannot allow this kind of cruelty.

Signature #165 Signer's Name: David Nemes
Country: US State: CA
Reason for signing Petition: I'm an animal rights proponent.

Signature #166 Signer's Name: coco hall
Country: US State: CA
Reason for signing Petition: I love the ocean animals. They deserve to live in peace.

Signature #167 Signer's Name: dianna dubrow
Country: US State: CA
Reason for signing Petition: My son is broken in our insane actions to maintain the balance of the planet. Please stop the destruction of marine mammals.

Signature #178 Signer's Name: Cindy Morrison
Country: US State: OR
Reason for signing Petition: We need to stop the noise thats killing our ocean mammals!!!!

Signature #179 Signer's Name: laure katz
Country: US State: CA
Reason for signing Petition: Many species of marine mammals are critically endangered. Many of these same species are being driven from their normal migration route in order to avoid low frequency noise pollution from anthropogenic and mostly military sources. If deterred too much they may never reach their breeding grounds. Strandings and deaths have also resulted when animals changed their migration pattern to avoid noise.

Signature #180 Signer's Name: michelle boltzman
Country: US State: CA
Reason for signing Petition: We need to protect our ocean animals, for their health and ultimately our own. Most importantly, it's the humane thing to do!

Signature #181 Signer's Name: Eli Carlton Pearson
Country: US State: MA
Reason for signing Petition: I am signing this petition because I have to. Too many human lives are being lost, liberty and benefit our intelligence has afforded us, but do not use these exceptional capabilities on others, even though nearly all cultures say they value harmony to the highest degree. The lack of comradery is grave enough within our own species, however the gap between us and the trillions of other species sharing the only life-harboring planet in the world with us is even more irrationally absurdly idiotic to suspect we can ignore the needs of these other life forms and cause a cascading state effect ours. I care about people. I care about whales. These are redundant statements. If we care about life-forms, we are smart enough to know this. So know we need to act.

Signature #182 Signer's Name: Lenore Norstrom
Country: US State: OR
Reason for signing Petition: Because this is a matter of moral rightness and planetary survival.

Signature #183 Signer's Name: Judith Burks
Country: US State: WA
Reason for signing Petition: It is morally indefensible to perpetrate wanton destruction of marine mammals.

Signature #184 Signer's Name: Lisa Bryant
Country: US State: CA
Reason for signing Petition: I'm deeply concerned about deadly, human-generated underwater noise and how it threatens ALL marine life. Continual education & support is critical.

Signature #185 Signer's Name: Christopher Scantland
Country: US State: CA
Reason for signing Petition: The destruction of the biosphere equals the destruction of the human system.

Signature #196 Signer's Name: Ann M. Hershey
Country: US State: CA
Reason for signing Petition: Please suspend all dangerous noise infractions in our oceans. You are destroying our beautiful and valuable ocean creatures!

Signature #197 Signer's Name: Brent Scott
Country: US State: CA
Reason for signing Petition: I value the ocean and everyone of its organisms. The ocean is home to a many creatures and we as humans have an obligation to not disturb their habitat.

Signature #198 Signer's Name: david shevick
Country: US State: CA
Reason for signing Petition: Marine life is essential to man's existence. Overfishing and harming whale with excessive sound is against humanity's interest.

Signature #199 Signer's Name: Maria Owl
Country: US State: CA
Reason for signing Petition: I have spent extended periods of time studying cetaceans and marine life and have received innumerable gifts through my openness to learn from them. I can't imagine a world without healthy oceans, without whales, without tide pools.

Signature #200 Signer's Name: Heidi Link
Country: US State: CA
Reason for signing Petition: I am signing this because whales and dolphins rely on their own ability to communicate, hunt and thrive. If we cloud their environment with noise pollution, we essentially render them blind and unable to navigate their home, making having to do everything...EVERYTHING...in the dark. That is what you do to these animals when you cloud their world with noise. It's unconscionable. It's simply unacceptable and inhumane. Please stop.

Signature #201 Signer's Name: celia mayo
Country: US State: CA
Reason for signing Petition: I believe that it is our responsibility as stewards of this planet to treat all creatures with great respect. Included in this is respect for the magnificent mammals of our oceans. I have spent time in the wild with dolphins and can attest to their greatness in spirit and being. Stop creating harm to the dolphins and their cousins, whales!

Signature #202 Signer's Name: Sally McKirgan
Country: US State: FL
Reason for signing Petition: Protect all creatures as if they were your own children...because they are!

Signature #203 Signer's Name: Rick Weber
Country: US State: CA
Reason for signing Petition: Stop destroying the planet with my tax money.

Signature #204 Signer's Name: Laurie Elsler
Country: US State: CA
Reason for signing Petition: To stop the destruction of marine mammals.

Signature #215 Signer's Name: miichael castagnola
Country: US State: CA
Reason for signing Petition: we need to honor the lives of all beings above profits

Signature #216 Signer's Name: Marlayne Williams
Country: US State: CA
Reason for signing Petition: This is as important an issue as protecting the environment...protecting the oceans wildlife. The noise is killing the whales and dolphins as well as other ocean inhabitants.

Signature #217 Signer's Name: Kat Markham
Country: US State: CA
Reason for signing Petition: Whales and Dolphins have the melody of life in their song. If they do not exist, who are we without life?

Signature #218 Signer's Name: KATIA EV
Country: GR State: NA
Reason for signing Petition: THIS PLANET IS NOT OURS. WE MUST RESPECT THE OTHER CREATURES. END OF STORY

Signature #219 Signer's Name: Eleni Yanni
Country: GR State: NA
Reason for signing Petition: Because species without voice have the right to survive. We as humans must protect and respect them.

Signature #220 Signer's Name: Niles Hays
Country: GR State: NA
Reason for signing Petition: Life is of unique value in all of its forms.

Signature #221 Signer's Name: Judy Shaw
Country: US State: CA
Reason for signing Petition: The oceans and their inhabitants are in need of protection from environmental polluters of all types - not just noise. But this is a great start.

Signature #222 Signer's Name: Diana J Bounald
Country: US State: HI
Reason for signing Petition: Our ocean friends need our help. We need to be stewards of the land and sea.

Signature #223 Signer's Name: Michelle Oldenburg
Country: US State: HI
Reason for signing Petition: We need to protect the gentle giants of the ocean. They deserve the right to live, just as we do.

Signature #224 Signer's Name: Coral Bruze
Country: US State: CA
Reason for signing Petition: Sonic noises and other large manmade noises destroy whales and other large mammal's abilities to track themselves, find food and maintain healthy, sustaining populations. We must stop this.

Signature #234 Signer's Name: John Jordan
Country: US State: CA
Reason for signing Petition: The health of the oceans is a legacy I, we, must leave intact to my and our children. Some day, somewhere in the universe, these children will catch up with us and in front of God and all mankind will speak to us about what we did leave them. Then, there will be no place to hide. I hope we will be standing with pride.

Signature #235 Signer's Name: Renee Bennelech
Country: US State: CA
Reason for signing Petition: To ensure the protection of Marine Mammals from Ocean Noise.

Signature #236 Signer's Name: Jean Salmon
Country: US State: CA
Reason for signing Petition: Because our oceans are already becoming very inhospitable for sea life and they don't have a voice.

Signature #237 Signer's Name: Lee Leiser
Country: US State: CA
Reason for signing Petition: I am concerned about the health and well being of whales being damaged by irresponsible technology being used in their habitat.

Signature #238 Signer's Name: Alec Marshall
Country: US State: CA
Reason for signing Petition: We must respect ourselves enough to realize that our environment and fellow earth inhabitants deserve our compassion and protection. We too depend on a healthy planet.

Signature #239 Signer's Name: Lucy D'Ma
Country: US State: CA
Reason for signing Petition: To protect marine mammals from noise pollution.

Signature #240 Signer's Name: Boda Brun del Re
Country: CH State:
Reason for signing Petition: We need to protect the environment!

Signature #241 Signer's Name: Michelle Harris
Country: US State: FL
Reason for signing Petition: I am signing this to protect our oceans.

Signature #242 Signer's Name: catherine burkham
Country: US State: OH
Reason for signing Petition: it is ridiculous to have sound emissions increased since there's scientific evidence that the extreme noise KILLS marine life.

Signature #243 Signer's Name: Jenessa Kenway
Country: US State: CA
Reason for signing Petition: In the spirit of compassion.

Signature #254 Signer's Name: Nicolette Stanbridge
Country: US State: CA
Reason for signing Petition: Why wouldn't I want to help this cause? I want the earth to be able to support me and the rest of us (most of us at least) throughout my lifetime and beyond and she's gonna give up on us if we don't respect her now.

Signature #255 Signer's Name: Kirsten Schatz
Country: US State: CA
Reason for signing Petition: Because with decent regulation, we can protect ocean wildlife from human disturbance.

Signature #256 Signer's Name: clyse gouzales
Country: US State: CA
Reason for signing Petition: im sick of people thinking we hold a superiority to every thing human beings are constantly looking for something to look down on, to say there better than you. They will kill, or misuse it. Like jews, black people, native americans, irish, etc now we are exploiting something that doesn't even have a voice to fight back. But I still have have in people. Especially if you have signed this, thank you.

Signature #257 Signer's Name: Gady Keystone
Country: US State: HI
Reason for signing Petition: NMFS has been, not just negligent, but actively supporting and enabling the US Navy to use technology that scientists, world wide, recognize as lethal to many cetaceans, especially cetaceans. NMFS should set strict noise parameters for military and commercial activities. They have abandoned, not enforced, the Marine Mammal Protection Act.

Signature #258 Signer's Name: Kat Spencer
Country: US State: CA
Reason for signing Petition: We need to save what little beauty we have left in this world and stop playing god.

Signature #259 Signer's Name: claudia tomaso
Country: US State: CA
Reason for signing Petition: This is an extremely important issue that should be addressed immediately.

Signature #260 Signer's Name: Barbara Stocking
Country: CA State:
Reason for signing Petition: It is essential to health of this planet and all life that she will protect the wellbeing of all -including marine life/animals. Ocean noise created by humans is important to stop.

Signature #261 Signer's Name: Danielle Marlowe
Country: US State: CA
Reason for signing Petition: Because I believe we need to protect ocean creatures.

Signature #262 Signer's Name: AnnMarie Miller
Country: US State: CA
Reason for signing Petition: In the spirit of compassion.

Signature #273 Signer's Name: polly defaria
Country: US State: AZ
Reason for signing Petition: Because it seems like the right thing to do.

Signature #274 Signer's Name: Monica DuCland
Country: US State: CA
Reason for signing Petition: The Marine Mammal Protection Act was established to protect magnificent marine life. Ocean noise levels generated by the Navy and other agencies threatens the survival of many species already on the brink. Europe has banned this type of ocean pollution. The US should follow suit.

Signature #275 Signer's Name: Eve Nilson
Country: US State: CA
Reason for signing Petition: Marine animals share our beautiful Mother Earth. We all deserve the chance for life and well-being, whether we walk or swim. With thanks to all the other signers, we have to do something!

Signature #276 Signer's Name: Marissa Breachin
Country: CH State:
Reason for signing Petition: Because for me this topic is of greatest importance, we have to do something!

Signature #277 Signer's Name: christopher wisler
Country: US State: CA
Reason for signing Petition: love the ocean and love the animals don't love the loud noisy polluting water vehicles

Signature #278 Signer's Name: warr greer
Country: US State: CA
Reason for signing Petition: marine mammals are sentient beings who rely on the ocean for their life and their environment.

Signature #279 Signer's Name: Melissa Clare
Country: US State: CA
Reason for signing Petition: We all need protection from ever escalating noise levels. What if we dolphins are sentient beings, and may well be more intelligent than some humans. Ocean environment nurtures us all

Signature #280 Signer's Name: elisabeth daystar
Country: US State: VA
Reason for signing Petition: i send this because i care about whales and dolphins. They are beautiful because they are a beautiful part of our world that we dont want to lose.

Signature #281 Signer's Name: Fletcher Wolfe
Country: US State: NY
Reason for signing Petition: We all, especially governments and other entities, need to be more conscious of the effects of our actions on the environment. Several large scale projects will further nature's beauty or even further. However, we all feel that our lives depend on the health of the planet. Let's try to stop this.

Signature #292 Signer's Name: Craig Imler
Country: US State: MD
Reason for signing Petition: Our oceans need attention, from dying coral reefs to dwindling fisheries from factory fishing vessels, to fish farms where genetically altered fish will impact the natural population we need to start acting on these issues.

Signature #293 Signer's Name: J. Barward
Country: US State: NH
Reason for signing Petition: Because our oceans are important, and they need to be protected.

Signature #294 Signer's Name: Heidi Hampe
Country: US State: CA
Reason for signing Petition: There needs to be adequate research done by the military to show what the impact will be from these studies. There is an unignorable impact and the question is, "What is the impact? We cannot go on good-faith with our military for obvious reasons. Whom will be held accountable from these tests... I want to know the name."

Signature #295 Signer's Name: Daris Wolpert Romang
Country: US State: CA
Reason for signing Petition: Marine mammals deserve to be protected in their own environment. We must remember we are all interdependent and must make conscious choices to care for our planet and all species.

Signature #296 Signer's Name: Cassie Pearson
Country: US State: CA
Reason for signing Petition: It's important to protect our resources. Our oceans sustain us all.

Signature #297 Signer's Name: V. McCann
Country: US State: NC
Reason for signing Petition: Let's do everything possible to promote and protect life in our oceans, which are life-giving to our whole planet.

Signature #298 Signer's Name: sosya harris
Country: US State: AK
Reason for signing Petition: because i want to

Signature #299 Signer's Name: marcus jesse
Country: US State: LA
Reason for signing Petition: I, like many others, have always wanted to see the beautiful world made for us to enjoy. It is time that we take responsibility and take whatever means necessary to protect our earth so our children can enjoy it many winters.

Signature #300 Signer's Name: John Halle
Country: US State: CA
Reason for signing Petition: To give voice to the

Signature #311 Signer's Name: vivienne Verdon-Roe
Country: US State: CA
Reason for signing Petition: Clearly the noise level in the oceans has increased to the point that we are literally torturing and killing marine mammals. This must be stopped.

Signature #312 Signer's Name: Jordan Ceko
Country: US State: CA
Reason for signing Petition: To stop ocean noise that interferes with our mammals communication and directional senses

Signature #313 Signer's Name: Kathy Bergan
Country: US State: CA
Reason for signing Petition: I love all marine animals and hope to help prevent harm to any of them.

Signature #314 Signer's Name: Berna...
Country: US State: CA
Reason for signing Petition: the least i can do to express my concern for our planet, our oceans, our mammalian, plant mates.

Signature #315 Signer's Name: Gitan Shuman
Country: US State: CA
Reason for signing Petition: Noise is just another man-made disaster that is destroying our planet from man. We need to help them.

Signature #316 Signer's Name: Heather Wain
Country: US State: CA
Reason for signing Petition: I believe it is important to improve the quality of our oceans and this is easy to forget about since we don't deal with it every day.

Signature #317 Signer's Name: Julie Rasmussen
Country: US State: LA
Reason for signing Petition: We have no right to disrupt their environment.

Signature #318 Signer's Name: morgan colley
Country: US State: CA
Reason for signing Petition: the torture and death of other

Signature #319 Signer's Name: Cary Stevens
Country: US State: CA
Reason for signing Petition: Protection of our precious wildlife.

Signature #320 Signer's Name: Ted Straus
Country: US State: CA
Reason for signing Petition: I want to live.

Signature #321 Signer's Name: ...
Country: US State: CA
Reason for signing Petition: ...

Signature #332 Signer's Name: Barbara Mussi
Country: IT State: NA
Reason for signing Petition: There are spatial and temporal links between some cetaceans mass stranding and the deployment of military sonar. There is evidence for serious injuries to several Odontocetes species who have been found with brain haemorrhages and evidence of acute and chronic tissue damage in stranded cetaceans that results from the formation in vivo of gas bubbles, challenging the view that these mammals do not suffer decompression sicknesses. Jepson et al. 2003 Nature, 425:575.



March 14, 2005

F. Michael Payne
Chief
Marine Mammal Conservation Division
Office of Protected Resources
Room 13635
1315 East-West Highway
Silver Spring, MD 20910
TP 301/713-2322

HAND DELIVERY

Re: Notice of Public Scoping and Intent to Prepare an Environmental Impact Statement, 70 FR 1871 (Jan. 11, 2005)

Dear Mr. Payne:

Enclosed for filing in the above-captioned proceeding are comments by the Center for Regulatory Effectiveness.

Sincerely,

Scott Slaughter

Attachment

COMMENTS BY THE CENTER FOR REGULATORY EFFECTIVENESS ON NOTICE OF PUBLIC SCOPING AND INTENT TO PREPARE AN ENVIRONMENTAL IMPACT STATEMENT: 70 FR 1871 (JAN. 11, 2005)

The Center for Regulatory Effectiveness ("CRE") appreciates this opportunity to comment on the above-captioned proceeding. CRE understands that the purpose of this proceeding is to develop science-based criteria for the assessment and regulation of acoustic effects on marine mammals. If CRE's understanding is correct, then we applaud NMFS for its efforts. Science-based criteria in this area are long overdue.

CRE intends to comment further when the actual acoustic criteria are available. CRE's comments at this point in the proceeding are summarized below with a more detailed discussion following the summary.

First, NMFS's development and use of the acoustic criteria must comply with Data Quality Act ("DQA") pre-dissemination review requirements, and NMFS must document DQA compliance in the administrative record of this proceeding and in the record of any further agency action involving the criteria.¹

Second, in order to be useful for regulatory purposes, the acoustic criteria should focus on assessment and regulation of acoustic effects on marine mammals at the population or stock level.

Third, the acoustic criteria should distinguish among various sound sources (e.g., sonar versus seismic) because they have different sound characteristics.

Fourth, any models relevant to the acoustic criteria should be developed and used in a manner consistent with DQA standards.

Fifth, NMFS should consider Potential Biological Removal ("PBR") as one of the alternatives in the Agency's EIS scoping and review of the acoustic criteria.

The DQA is codified at 44 U.S.C. § 3516 historical and statutory notes. NMFS is subject to the Office of Management and Budget's ("OMB") government-wide DQA guidelines and the agency-specific DQA guidelines published by the Department of Commerce ("DoC") and by the National Oceanic and Atmospheric Administration ("NOAA"). The text of the DQA is available at http://www.there.com/quality/OMB_Implements_New_DataQualityLaw.html#StatutoryLanguageforDataQuality. The OMB government-wide DQA guidelines are available at FR (Feb. 22, 2002) and at <http://www.whitehouse.gov/omb/foi/reg/reproducible2.pdf>. The DoC DQA guidelines are available at <http://www.osce.doc.gov/cio/oip/eqg.html>. The NOAA DQA guidelines are available at <http://www.noanews.noaa.gov/stories/q.htm>.

Sixth, NMFS should state clearly whether any final acoustic criteria will be binding on NMFS decision makers and explain how the criteria relate to the regulatory process. There should also be some mechanism for adopting final criteria to new studies and data.

I. NMFS MUST COMPLY WITH THE DQA PRE-DISSEMINATION REVIEW REQUIREMENTS

The DQA, OMB's DQA guidelines, DoC's DQA guidelines, and NOAA's DQA guidelines establish quality standards that NMFS must meet before it publicly disseminates information regarding the acoustic criteria, including but not limited to the criteria themselves. The DQA and relevant DQA guidelines require that NMFS establish a pre-dissemination review process to ensure these quality standards are met. At the San Francisco public hearing on the acoustic criteria scoping, NMFS representatives stated that NMFS will comply with these DQA requirements with respect to the criteria.

The OMB government-wide DQA guidelines require that agencies establish a pre-dissemination review process to "substantiate the quality of the information [the agency] has disseminated..."² In discussing the need for the pre-dissemination review process, OMB emphasizes, "Agencies shall treat information quality as integral to every step of an agency's development of information, including creation, collection, maintenance, and dissemination."³

The DoC guidelines emphasize that the Department's "goal is to ensure and maximize the quality of information we release to the public. We are committed to making the methods, models, and processes that produce our information transparent and rigorous."⁴

The NOAA DQA guidelines confirm the agency's commitment to pre-dissemination review in order to ensure compliance with the DQA quality standards:

"Information quality is composed of three elements — utility, integrity and objectivity. Quality will be ensured and established at levels appropriate to the nature and timeliness of the information to be disseminated. Information quality is an integral part of the pre-dissemination review of information disseminated by NOAA."⁵

CRE commends NMFS on its commitment to DQA pre-dissemination review for the

² 67 FR 8459 (Feb. 22, 2002).

³ *Id.*

⁴ DoC Guidelines, "Commerce Commitment to Information Quality"

⁵ NOAA Guidelines, Part II.

acoustic criteria. CRE has previously commented to NMFS on implementation of the DQA pre-dissemination review requirements with respect to acoustic effects on marine mammals. CRE's previous comments and their attachments are incorporated by reference into these CRE comments on the acoustic criteria EIS scoping.⁶

II. THE ACOUSTIC CRITERIA SHOULD FOCUS ON BIOLOGICALLY SIGNIFICANT EFFECTS ON POPULATIONS OR STOCKS OF MARINE MAMMALS

In response to CRE's comments on a recent Incidental Hazard Authorization ("IHA") application, NMFS explained that the Marine Mammal Protection Act ("MMPA") requires NMFS

"[t]o authorize the taking of marine mammals incidental to otherwise lawful activities, provided that the activity will have no more than a negligible impact on the affected species or stock of marine mammals. 'Negligible impact' is defined in 50 CFR 216.103 [as 'an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival']... This is the relevant standard for the Secretary's decision. Although the term 'biologically significant' is not used, this concept is captured through application of NMFS' definition of 'negligible impact.'"⁷

CRE understands this NMFS statement to mean the "relevant standard" is biologically significant effects on the population level.

If CRE's understanding is correct, then CRE agrees with NMFS's above-quoted interpretation of its duty under the MMPA, which will be the relevant statutory standard for most NMFS decisions regarding marine mammals and acoustic effects.

Therefore, in order to be used for regulatory purposes, the acoustic criteria should enable

⁶ CRE's previous DQA comments to NMFS are attached as an Appendix to CRE's comments on NMFS's acoustic criteria scoping. These previous CRE comments and their attachments are incorporated herein by reference.

⁷ 70 FR 8768, 8772 (Feb. 23, 2005). The NMFS interpretation of the regulatory standard was affirmed by the court in *NRDC v. Evans*, 279 F.3d 1129, 1158-59 (N.D. Calif. 2003), where the court cited congressional intent that the term "negligible impact" means "an impact that cannot reasonably be expected to, and is not likely to affect adversely the overall population through effects on annual rates of recruitment or survival..." *Id.* at 1158-59 (quoting 132 Cong. Rec. 16305 (Oct. 15, 1986)).

decision makers to assess a particular sound source's effects on marine mammal populations or stocks. Any effect that is not biologically significant on the population or stock level (*i.e.*, does not significantly affect the survival of the population or stock) should not be a matter of regulatory concern. Any such insignificant effects should at least be automatically granted "small take" authorization/permits.

III. THE BEST AVAILABLE SCIENCE AND EVIDENCE IS THAT ANTHROPOGENIC SOUND HAS NO EFFECT ON MARINE MAMMAL POPULATIONS AND STOCKS

There is "no evidence that anthropogenic noise has had a significant impact on any marine mammal population."⁸ This unequivocal conclusion is from a recent report by the National Research Council ("NRC") of the National Academy of Science.

NMFS itself has concluded that there is no evidence of any marine mammal physical effects from seismic operations.⁹ For example, NMFS recently stated, "Temporary or permanent hearing impairment is a possibility when marine mammals are exposed to very strong sounds, but there has been no specific documentation of this for mammals exposed to [seismic] airgun pulses."¹⁰

Similarly, NMFS stated that "there is no specific evidence that exposure to pulses of airgun sounds can cause PTS in any marine mammals, even with the largest airgun arrays..."; and that "marine mammals are unlikely to be exposed to received levels of seismic pulses that could cause TTS..."¹¹

With regard to non-auditory physiological effects, NMFS recently stated :

"Possible types of non-auditory physiological effects or injuries that might theoretically occur in marine mammals exposed to strong underwater sound might include stress, neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage. There is no evidence that any of these effects occur in marine mammals

⁸ <http://www.nmcs.gov/sound/nlenary4/ndf/wartzek.pdf> (Slide 13).

⁹ 70 FR 8768, 8770-71, 8774-76 (Feb. 23, 2005).

¹⁰ *Id.* at 8774.

¹¹ *Id.* at 8775.

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exposed to sound from airgun arrays (even large ones).¹²

In light of the current evidence and science, it is not surprising that the Minerals Management Service issued a NEPA Finding of No Significant Impact with regard to seismic oil and gas explorations in the Gulf of Mexico.¹³

Speculation that PTS or TTS or some other effect might possibly be caused by airguns or other sources of seismic sound is not science or evidence of such effects. The acoustic criteria should avoid any such speculation as not supported by the best available science and evidence, or by any science or evidence at all.

With regard to sonar, the International Council for the Exploration of the Sea recently concluded, "It appears that sonar is not a major threat to marine mammal populations generally, nor will it ever be likely to form a major part of ocean noise."¹⁴

CRE is not aware of any evidence that anthropogenic sound has any biologically significant effect on marine mammal populations or stocks, and that is the relevant regulatory standard that the acoustic criteria should address and reflect. 12

III. THE ACOUSTIC CRITERIA SHOULD CLEARLY DISTINGUISH AMONG DIFFERENT SOUND SOURCES

Not all sounds are the same. The acoustic criteria should clearly distinguish among different sound sources, such as seismic and sonar. They should also address only population or stock level effects for each type of sound. Once again, the best available science and evidence is that there are no such effects for seismic, sonar, or any other anthropogenic sound. 13

¹² *Id.* at 8776.

¹³ <http://www.gomr.mms.gov/homepage/regulate/environ/nepa/2004-054.pdf>

¹⁴ Report of the Ad-hoc Group on the Impact of Sonar on Cetaceans and Fish (AGISC), at page 28, International Council for the Exploration of the Sea, ICES Advisory Committee on Ecosystems, ICES CM 2005/ACE:01 (2005)

¹⁵ See generally 70 FR 8768, 8776 (Feb. 23, 2005).

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V. NMFS SHOULD CONSIDER PBR IN ITS NEPA ALTERNATIVES ANALYSIS

The NRC's Biological Diversity Report recommended use of Potential Biological Removal ("PBR") to assess and regulate acoustic effects on marine mammals.²¹ The PBR was developed by NMFS. It has been widely and successfully used in regulating commercial fisheries. It has been demonstrated to be reasonably accurate and reliable if developed and applied correctly. It is especially useful in circumstances where there are limited data.²² It is designed and used to prevent biologically significant effects on marine populations and stocks. It is a perfect fit for the marine mammals acoustic effects context.

Yet, based on the relevant *Federal Register* notices and public hearings, PBR is not an option being considered by NMFS as an alternative. Why not? 16

VI. NMFS SHOULD CLARIFY WHETHER THE ACOUSTIC CRITERIA ARE BINDING AND EXPLAIN THEIR ROLE IN THE REGULATORY PROCESS

CRE representatives at the public meetings on the acoustic criteria asked whether the final criteria will be binding on NMFS decision makers. The NMFS representatives at the meetings gave inconsistent responses to this question.

NMFS should clarify this issue by stating clearly in the *Federal Register* whether the final acoustic criteria will be binding on NMFS decision makers and by explaining how the criteria relate to the NMFS regulatory process. 17

In addition, NMFS should develop some process that allows modification of the criteria to accommodate new data or studies that are generated after the criteria are final, but which warrant modification of the final criteria. 18

of App. A, is incorporated by reference herein.

²¹ *Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects*, pages 51-52 (NAS 2005).

²² *Id.*

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IV. NMFS SHOULD DOCUMENT, VALIDATE, AND MAKE PUBLICLY AVAILABLE ALL MODELS RELEVANT TO THE ACOUSTIC CRITERIA

Development and application of the acoustic criteria will presumably rely on certain models to determine sound propagation in water and for other purposes. CRE is aware of specific models that have been used in this context: e.g., the Acoustic Integration Model ("AIM") and the Lamont-Doherty Earth Observatory Model ("L-DEO").

In response to CRE comments, NMFS has acknowledged that the L-DEO Model has flaws and limitations.¹⁶ CRE understands that the AIM Model is proprietary and is, therefore, unavailable to the public.¹⁷ Consequently, the AIM's model's accuracy and reliability are impossible to judge.

NMFS should ensure that all models relevant to the acoustic criteria are sufficiently accurate, reliable and transparent to warrant their use. NMFS should also make the documentation and components of these models publicly available so that stakeholders can verify NMFS's verification of the models. The best way to achieve these goals is to establish an NMFS web site containing the necessary information. 14

The United States Environmental Protection Agency ("EPA") has established valuable precedent and developed useful guidance in this area.¹⁸ EPA's models web site is also a 'model' for other agencies in this area.¹⁹

CRE cannot emphasize too strongly the need to ensure the public that models used by the acoustic criteria meet Data Quality Act standards. CRE urges NMFS to comply with those standards by adopting EPA's models validation, verification, documentation and disclosure process.²⁰ 15

¹⁶ 70 FR 8768, 8771 (Feb. 23, 2005)

¹⁷ The AIM model is discussed at <http://64.233.161.104/search?q=cache:ibdkuJM8lg:www.nap.edu/openbook/0309085365/nm/121.htm+aim+AND+%22marine+mammals%22+&hl=en>. The AIM model is also discussed in *Evans*, 279 F. Supp. at 1185-86.

¹⁸ EPA's draft guidance for developing and using models is available at http://www.epa.gov/osp/crem/library/CREM%20Guidance%20Draft%2012_03.pdf

¹⁹ EPA's models database is available at http://efpub.epa.gov/crem/knowledge_base/knowledge.cfm#overview

²⁰ This models issue is further discussed in App. A to these comments, pages 1-2 and 7-9, and in the App. A attachments cited by those pages. This discussion, as well as the rest

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VI. RECOMMENDATIONS

- NMFS should document compliance with the DQA in the administrative record for this proceeding and all other relevant proceedings, and make that documentation publicly known and available.
- NMFS should ensure that any final acoustic criteria focus on assessment and regulation of acoustic effects on marine mammals on the population or stock level.
- Any final acoustic criteria should clearly distinguish among different sound sources.
- In order to comply with the DQA, NMFS should treat any and all models relevant to the acoustic criteria in a manner analogous to EPA's treatment of models it uses.
- NMFS should consider use of PBR as an alternative.
- NMFS should explain whether any final acoustic criteria will be binding on NMFS decision makers and how the criteria relate to the NMFS regulatory process. There should also be some mechanism for adapting final criteria to new studies and data.


Scott Slaughter
The Center for Regulatory Effectiveness

Attachment

APPENDIX TO

COMMENTS BY THE CENTER FOR REGULATORY EFFECTIVENESS ON NOTICE OF PUBLIC SCOPING AND INTENT TO PREPARE AN ENVIRONMENTAL IMPACT STATEMENT: 70 FR 1871 (JAN. 11, 2005)

COMMENTS BY THE CENTER FOR REGULATORY EFFECTIVENESS ON EIS SCOPING FOR GULF MARINE MAMMALS ACOUSTIC EFFECTS



Center for Regulatory Effectiveness

December 22, 2004

Mr. Steve Leathery
Chief
Permits
Conservation and Education Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway,
Silver Spring, MD 20910-3226

Re: Comments on EIS Scoping Notice at 69 FR 67535

Dear Mr. Leathery,

Attached are comments by the Center for Regulatory Effectiveness in the above-captioned matter. Please contact me if you have any questions regarding our comments.

Sincerely,


Scott Slaughter

Attachments

Center for Regulatory Effectiveness

COMMENTS BY THE CENTER FOR REGULATORY EFFECTIVENESS ON EIS SCOPING FOR GULF MARINE MAMMALS ACOUSTIC EFFECTS

I. INTRODUCTION

The Center for Regulatory Effectiveness ("CRE") submits the following comments on the National Marine Fisheries Service's ("NMFS") Notice of Intent to prepare an Environmental Impact Statement ("EIS") on possible effects on marine mammals of seismic operation by the oil and gas industry in the Gulf of Mexico ("GOM"). The NMFS Notice is published at 69 FR 67535 (Nov. 18, 2004), and was issued in response to an application for Incidental Take Authorization ("ITA") by the Marine Minerals Service ("MMS").

CRE understands from the Notice that NMFS is now beginning to scope the EIS. Given that the EIS process is at an early stage, CRE will limit these comments to general issues affecting the EIS. CRE anticipates filing subsequent comments addressing more specific issues.

II. EXECUTIVE SUMMARY OF CRE'S COMMENTS

The NMFS must comply with the pre-dissemination review requirements of the Data Quality Act ("DQA") before the agency disseminates a draft or final EIS or other information regarding the EIS.¹

The NMFS must document its compliance with the DQA pre-dissemination review requirements in the administrative record for the draft and final EIS and for other information that NMFS disseminates regarding the EIS.

The text of and appendices to CRE's comments suggest a process for ensuring compliance with these DQA pre-dissemination review and documentation requirements.

CRE requests that NMFS

- identify all information relating to the draft and final EIS (including models) that the agency cannot disclose;
- explain why NMFS cannot disclose that information (including models) and the steps that NMFS took to obtain the ability to disclose the information;
- explain why NMFS has to use that information (including models); and

¹ The DQA is codified at 44 U.S.C. § 3516 historical and statutory notes.

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- provide CRE with the "nature and a description" of the robustness checks NMFS performed for that information (including models), and use this definition as necessary for the draft and final EIS and related information.

NMFS should adopt the definition of "robustness checks" used by the U.S. Environmental Protection Agency ("EPA").

NMFS should answer CRE's questions in the text below regarding the "scientifically-based risk assessment" referenced in NMFS's *Federal Register* Notice about the EIS scoping.

NMFS should as soon as possible provide the public with a schedule for the GOM EIS process.

NMFS should confirm that the agency will not issue a draft or final EIS until "new acoustic guidelines for assessing impacts of sound on marine mammals" are published and there has been sufficient time to review and incorporate the new guidelines into both the draft and final EIS. NMFS cannot perform a draft or final EIS until these new acoustic guidelines are available because they provide "the grounds on which to base regulatory and management decisions using the best and most current science available."¹⁰

III. CRE'S PRIOR SUBMISSIONS ON DQA PRE-DISSEMINATION REVIEW

CRE's primary interest in this process is application of the DQA pre-dissemination review requirements to the EIS. CRE has long had an interest in and has long been a proponent of the DQA and its implementation by federal agencies like NMFS. For example:

- CRE submitted to MMS a White Paper suggesting a process for ensuring and documenting compliance with the DQA pre-dissemination review requirements.¹¹
- CRE and EPA discussed application of the DQA pre-dissemination review requirements to models at a conference sponsored by MMS.¹²

¹⁰ Meeting Summary at p. 20, Advisory Committee on Acoustic Impacts on Marine Mammals, Marine Advisory Committee, (April 28, 2004).

¹¹ Attachment A to these comments.

¹² CRE's written presentation at this MMS conference is attached to these comments as Appendix B. EPA's written presentation is attached as Appendix C.

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dissemination review of information disseminated by NOAA.¹³

The OMB DQA guidelines require that NMFS document its compliance with the DQA pre-dissemination review requirements in the record for the information dissemination or in some other "appropriate" manner given the nature of the information dissemination: "This process shall enable the agency to substantiate the quality of the information it has disseminated through documentation or other means appropriate to the information."¹⁴

The Department of Commerce ("DOC") considers the pre-dissemination review, documentation, and other DQA requirements to be "performance standards" for NMFS:

"In keeping with the guidance provided by OMB, the Department views its information quality guidelines as performance standards. NOAA's information quality guidelines apply to all its line (component) offices."¹⁵

The DQA pre-dissemination review process requires that NMFS ensure compliance with the DQA "objectivity" standard before the agency disseminates the draft or final EIS or related information. The NOAA DQA guidelines explain that:

"Objectivity consists of two distinct elements: presentation and substance. The presentation element includes whether disseminated information is presented in an accurate, clear, complete, and unbiased manner and in a proper context. The substance element involves a focus on ensuring accurate, reliable, and unbiased information. In a scientific, financial, or statistical context, the original and supporting data shall be generated, and the analytic results shall be developed, using sound statistical and research methods."¹⁶

Under the DQA guidelines, "influential scientific, financial, or statistical information" is subject to more rigorous objectivity standards, especially with regard to transparency and

¹³ NOAA DQA guidelines, Part II, available online at <http://www.noanews.noaa.gov/stories/iq.htm>.

¹⁴ 67 FR 8459 (Feb. 22, 2002).

¹⁵ DOC Response to Comment on DQA guidelines, available online at <http://www.osec.doc.gov/cio/oip/iq.html>

¹⁶ NOAA DQA guidelines, Part I, *supra* Footnote 9.

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- CRE filed comments on NMFS's draft Strategic Plan that suggested a process for ensuring and documenting compliance with the DQA pre-dissemination review requirements.¹⁷

The above-listed CRE submissions on DQA pre-dissemination review are incorporated by reference into CRE's comments on NMFS's draft EIS scoping.

IV. THE DQA PRE-DISSEMINATION REVIEW AND DOCUMENTATION REQUIREMENTS

The DQA requires that NMFS meet specified quality standards before it disseminates information to the public.¹⁸ The DQA further requires the Office of Management and Budget ("OMB") to publish government-wide DQA guidelines and to oversee both the federal agencies' compliance with the OMB guidelines and the agencies' development of their own guidelines.¹⁹

The OMB has issued DQA guidelines which require that NMFS establish a DQA pre-dissemination review process for its information disseminations:

"As a matter of good and effective agency information resources management, agencies shall develop a process for reviewing the quality (including the objectivity, utility, and integrity) of information before it is disseminated. Agencies shall treat information quality as integral to every step of an agency's development of information, including creation, collection, maintenance, and dissemination."²⁰

The National Oceanic and Atmospheric Administration's ("NOAA") DQA Guidelines reiterate the DQA requirement that NMFS review and ensure the quality of information before the agency disseminates the information to the public:

"Information quality is composed of three elements — utility, integrity and objectivity. Quality will be ensured and established at levels appropriate to the nature and timeliness of the information to be disseminated. Information quality is an integral part of the pre-

¹⁷ CRE's comments on NMFS's draft Strategic Plan are attached to these comments as Appendix D.

¹⁸ 44 U.S.C. § 3516 historical and statutory notes.

¹⁹ *Id.*

²⁰ 67 FR 8459 (Feb. 22, 2002).

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reproducibility.²¹

The DQA pre-dissemination review process also requires that NMFS ensure compliance with the DQA "utility" standard before the agency disseminates the draft or final EIS or related information. The NOAA DQA guidelines explain the "utility" standard as follows, with a heavy emphasis on transparency:

"Utility refers to the usefulness of the information to its intended users, including the public. In assessing the usefulness of information that the agency disseminates to the public, NOAA considers the uses of the information not only from its own perspective but also from the perspective of the public. As a result, when transparency of information is relevant for assessing the information's usefulness from the public's perspective, NOAA takes care to ensure that transparency has been addressed in its review of the information."²²

The DQA pre-dissemination review requirements apply to all information that NMFS uses in the draft and final EIS and in related information disseminations, including information prepared and/or submitted by third parties.

V. SUMMARY OF RECOMMENDED DQA PRE-DISSEMINATION REVIEW PROCESS FOR DRAFT AND FINAL EIS AND RELATED INFORMATION

CRE submitted a White Paper to MMS recommending that the agency adopt and implement the DQA pre-dissemination review process described in CRE's Paper.²³ The process recommended by CRE's White Paper is a composite of the pre-dissemination review and documentation processes already embodied in the Department of Interior/MMS DQA

²¹ NOAA DQA guidelines, Part I (emphasis in original), *supra* Footnote 9.

²² NOAA DQA guidelines, Part I (emphasis in original), *supra* Footnote 9.

²³ As already noted, CRE's MMS White paper is attached to these comments as Appendix A

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guidelines,¹⁶ in the Department of Transportation ("DOT") DQA guidelines,¹⁷ and in the EPA DQA guidelines.¹⁸ The DOI/MMS, DOT, and EPA DQA guidelines each contain important elements of a reliable, effective pre-dissemination review process. The outstanding elements of each agency's guidelines should be combined into a comprehensive pre-dissemination review and documentation process that ensures the dissemination of high quality information with regard to the draft and final EIS.

The steps in this process are summarized below in temporal order. Appendix A to these comments discusses each step in far more detail.

1. **Review and Consultation**-- For each information dissemination regarding the draft and final EIS, NMFS should review its data and research needs, and consult with stakeholders regarding those needs, early and often during the development of the information to be disseminated.¹⁹

2. **Compliance Verification**-- NMFS should ensure that all information the agency disseminates regarding the draft and final EIS meets the DQA objectivity and utility standards.²⁰

3. **Influential Information**--NMFS should ensure that all "influential scientific, financial, or statistical information" that the agency disseminates regarding the draft and final EIS complies with the more stringent DQA standards that apply to such information.²¹

4. **Data and Analyses Used Must Support NMFS's Conclusions and Fulfill NMFS's Intentions**--NMFS should ensure that the data, reports, and analyses the agency uses for the draft and final EIS and related information support NMFS's conclusions and are

¹⁶ The DOI DQA guidelines are available online at <http://www.doi.gov/ocio/guidelines/113Guides.pdf>. The MMS DQA guidelines are available online at <http://www.mms.gov/qualityinfo/PDF/MMSQualityInfoGuidelines-Final-SolChanges.pdf>.

¹⁷ The DOT DQA guidelines are available online at <http://dmses.dot.gov/submit/DataQualityGuidelines.pdf>.

¹⁸ The EPA DQA guidelines are available online at <http://www.epa.gov/quality/information/guidelines/>.

¹⁹ See App. A at p. 5 for a detailed discussion of this component.

²⁰ See App. A at p. 6 for a detailed discussion of this component.

²¹ See App. A at p. 8 for a detailed discussion of this component.

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that model developers and users: (a) subject their model to credible, objective peer review; (b) assess the quality of the data they use; (c) corroborate their model by evaluating the degree to which it corresponds to the system being modeled; and (d) perform sensitivity and uncertainty analyses. Sensitivity analysis evaluates the effect of changes in input values or assumptions on a model's results. Uncertainty analysis investigates the effects of lack of knowledge and other potential sources of error in the model (e.g., the "uncertainty" associated with model parameter values) and when conducted in combination with sensitivity analysis allows a model user to be more informed about the confidence that can be placed in model results. A model's quality to support a decision becomes known when information is available to assess these factors.²²

NMFS should apply a similar process to its use of models for the draft and final EIS and related information.

VII. CRE'S REQUEST FOR DISCLOSURE OF NMFS'S "ESPECIALLY RIGOROUS ROBUSTNESS CHECKS" RELATING TO THE EIS

NOAA's DQA guidelines state with regard to "information which cannot be disclosed":

Confidential and proprietary data, and other supporting information which cannot be disclosed. Where confidentiality or other considerations preclude full transparency, then especially rigorous robustness checks will be applied. They may take many forms, ranging from the use of outside review panels to the use of an array of specific checks to ensure objectivity. The nature and a description of these checks will be disclosed upon request.²³

CRE discusses the DQA requirements applicable to proprietary models and other "information which cannot be disclosed" in Appendices A, B and C to these comments. These attached comments will not be reiterated here, but are incorporated by reference.

CRE does, however, request in these EIS comments that

- NMFS identify all information relating to the draft or final EIS that it cannot disclose;
- explain why NMFS cannot disclose that information and the steps that NMFS took

²² *Id.*

²³ NOAA DQA guidelines, Part II (emphasis in the original), *supra* Footnote 9.

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consistent with the agency's intent in disseminating the information.²⁴

5. **Transparency**--NMFS should make every possible effort to ensure that all information the agency uses for the draft and final EIS and related information is publicly available.²⁵

6. **Perform Especially Rigorous Robustness Checks**--If NMFS uses any information for the draft and final EIS or related information that is not publicly available, then the agency should ensure that the information passes especially rigorous robustness checks, and NMFS should document its robustness checks in the administrative record.²⁶

7. **Record of Pre-dissemination Review**--NMFS should document its pre-dissemination review in the administrative record for the draft and final EIS and related information.²⁷

VI. DQA REQUIREMENTS FOR MODELS

CRE understands that NMFS intends to use models to generate impact assessment information for incorporation in the draft and final EIS. Transparency is especially important with respect to models, and accordingly the use of proprietary models should be avoided. Appendices A, B and C to CRE's EIS comments explain that models and model results must also meet the DQA pre-dissemination review requirements. EPA, working primarily through its Council for Regulatory Environmental Modeling ("CREM"), has developed excellent draft guidance on the development and use of models in a manner designed to meet DQA pre-dissemination review requirements.²⁸ The draft EPA guidance is lengthy and complex, and it is discussed in detail in Appendices A, B and C to these comments. These Appendices are incorporated by reference and will not be reiterated here, other than to provide EPA's executive summary of its process for ensuring that models are developed and used in a manner that generates information meeting DQA standards:

"This Guidance recommends best practices to help determine when a model, despite its uncertainties, can be appropriately used to inform a decision. Specifically, it recommends

²² See App. A at p.9 for a detailed discussion of this component.

²³ See App. A at p. 10 for a detailed discussion of this component.

²⁴ See App. A at p.10 for a detailed discussion of this component.

²⁵ See App. A at p. 11 for a detailed discussion of this component.

²⁶C EPA's draft models guidance is available at http://www.epa.gov/osp/crem/library/CREM%20Guidance%20Draft%2012_03.pdf

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to obtain the ability to disclose the information;

- explain why NMFS has to use that information; and
- provide CRE and the rest of the public with the "nature and a description" of the "especially rigorous robustness checks" NMFS performed on all information (including models) relating to the draft or final EIS.

In addition, CRE recommends that NMFS follow EPA's lead with regard to robustness checks of models under the DQA. EPA's draft model guidance defines "robustness" with respect to models as follows:

"The degree of similarity between calibration data and corroboration data provides a measure of robustness of model performance.... Robustness is defined in this guidance as the capacity of a model to perform equally well across the full range of environmental conditions for which it was designed. The degree of similarity among data sets available for calibration and corroboration provides insight into the robustness of the model. For example, if the dataset used to calibrate a model is identical or statistically similar to the dataset used to corroborate a model, an independent measure of the model's performance has not been provided. In this case, the exercise has provided no insight into model robustness. Conversely, when model outputs are similar to corroboration data that are significantly different from the calibration data, the corroboration exercise provides a measure of both model performance and robustness."²⁹

CRE believes that EPA's definition of "robustness" is consistent with sound science, is practicable, and should be adopted, at least with regard to models, for NMFS's work on the draft and final EIS and related information.

VIII. QUESTIONS ABOUT "SCIENTIFICALLY-BASED RISK ASSESSMENT" AND "NEW ACOUSTIC GUIDELINES"

The NMFS Notice states that the agency decided to begin scoping the EIS now for five reasons. Two of those reasons are

"incorporation of a scientifically-based risk assessment for marine mammals...and... incorporation of new acoustic guidelines for assessing impacts of sound on marine mammals."³⁰

²⁹ EPA Models Guidance at p. 22, *supra* Footnote 26.

³⁰ 69 FR 67535, 67536 (Nov. 18, 2004).

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At a public hearing on the EIS, CRE understood the NMFS representatives to state that there is not yet any new "scientifically-based risk assessment for marine mammals," but the agency is trying to develop one. Any new risk assessment would probably not be available for the draft or final EIS. When a new "scientifically-based risk assessment" is developed, it will be used in another EIS for acoustic effects on marine mammals that is broader in scope than the Gulf of Mexico.

Assuming that CRE correctly understood the NMFS representatives's statements at the public hearing, then

- what is the meaning of the Notice's discussion of the risk assessment quoted above;
- what new risk assessment is being developed by NMFS;
- what risk assessment will be used for the draft and final EIS; and
- what is the nature and schedule for the broader EIS ?

CRE also believes that a schedule for the GOM EIS would assist public participation in the process. CRE requests that NMFS provide the public with such a schedule.

As another question, CRE understands that the "new acoustic guidelines" have not yet been published. CRE further understands that NMFS will not issue a draft or final EIS until the new acoustic guidelines are published and there has been sufficient time to review and incorporate them into the draft or final EIS. CRE requests that NMFS inform CRE and the rest of the public if CRE's understanding is correct.

CRE does not understand how NMFS could issue a draft EIS, or can even begin scoping one, until the new acoustic guidelines have been published and reviewed. These new guidelines are

"the work of an expert scientific panel convened by NOAA Fisheries to develop noise exposure criteria for marine mammals. In an environment characterized by increased attention to, and public interest in, the issue of potential impacts of noise on marine mammals, as well as evolving scientific understanding, NOAA Fisheries brought together a panel of science experts to provide the grounds on which to base regulatory and management decisions using the best and most current science available.

"In his remarks introducing the work of the noise exposure criteria panel, Dr. Gentry described the expert panel that was convened by NOAA Fisheries and charged to "develop science-based criteria for the onset of tissue injury and behavioral disruption from noise

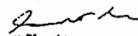
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scoping.

CRE requests that NMFS provide a schedule for the GOM EIS process.

CRE requests that NMFS confirm that the agency will not issue a draft or final EIS until "new acoustic guidelines for assessing impacts of sound on marine mammals" are published and there has been sufficient time to review and incorporate the new guidelines into both the draft and final EIS. NMFS cannot perform a draft or final EIS until these new acoustic guidelines are available because they provide "the grounds on which to base regulatory and management decisions using the best and most current science available."

Sincerely,


Scott Slaughter
The Center for Regulatory Effectiveness

Attachments

Center for Regulatory Effectiveness

exposure without considering harassment as defined by current law."³¹

Assuming that this characterization of the new guidelines is accurate, then NMFS has intended them to form the scientific basis for actions like the Gulf EIS. No draft or final EIS could have scientific basis without these "science-based criteria."

X. CONCLUSION

CRE thanks NMFS for this opportunity to comment on the EIS scoping. As discussed above:

NMFS must comply with the pre-dissemination review requirements of the Data Quality Act ("DQA") before NMFS disseminates a draft or final EIS or other information regarding the EIS.

NMFS must document its compliance with the DQA pre-dissemination review requirements in the administrative record for the draft and final EIS and for any other information NMFS disseminates regarding the EIS.

NMFS should adopt and implement the pre-dissemination review and documentation process set forth in the text of and appendices to CRE's comments.

CRE requests that NMFS

- identify for the public all information (including any models) relating to the draft and final EIS that the agency cannot disclose;
- explain why NMFS cannot disclose that information and the steps that NMFS took to obtain the ability to disclose the information (including models);
- explain why NMFS has to use that information (including models); and
- provide CRE and the public with the "nature and a description" of the "especially rigorous robustness checks" NMFS performed on that information (including models).

* CRE requests that NMFS answer CRE's questions set forth in the text above about the "scientifically-based risk assessment" referenced in NMFS's Federal Register Notice of EIS

Meeting Summary at p. 20. Advisory Committee on Research and Reports on Marine Mammals, Marine Advisory Committee (1997), 20-21.

APPENDIX A TO

COMMENTS BY THE CENTER FOR REGULATORY EFFECTIVENESS
ON EIS SCOPING FOR GULF MARINE MAMMALS
ACOUSTIC EFFECTS

Pre-Dissemination Review Under the Data Quality Act

Before the:
Minerals Management Service

November 2004

The Center for Regulatory Effectiveness

Center for Regulatory Effectiveness

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Pre-Dissemination Review Under the Data Quality Act

Before the:
Minerals Management Service

Before the:

Minerals Management Service

Before the:



Center for Regulatory Effectiveness

November 1, 2004

Mr. A. Scott English
Division of Policy and Appeals
Point-of-Contact for Quality of Information
U.S. Department of the Interior
Minerals Management Service
1849 C Street, N.W.
Washington, D.C. 20240

RE: Response to Quality of Information Petition

Dear Mr. English:

On behalf of the Center for Regulatory Effectiveness, I thank you for your prompt October 5, 2004 response ("Response") to CRE's Petition for Compliance with the Data Quality Act's Pre-Dissemination Review Requirements ("Petition"). Our Petition concerned a draft Incidental Take Authorization for oil and gas seismic exploration activities in the Gulf of Mexico ("Draft ITA"). The Response states that the Minerals Management Service is not preparing a Draft ITA, and that MMS seeks to comply with the DQA pre-dissemination review requirements for all information it disseminates regarding the effects of sound on marine mammals during oil and gas seismic exploration in the Gulf. To this end, we are submitting the attached White Paper on pre-dissemination review for your consideration.¹

¹ This White Paper is also submitted pursuant to MMS's request for comments "at any time" on MMS's implementation of the DQA through the Agency's DQA Guidelines. The MMS IQA Guidelines are available at <http://www.mms.gov/qualityinfo/PDF/MMSQualityInfoGuidelines-Final-SoIChanges.pdf>. The request for comments is on page 1 of the Guidelines. CRE's initial comments on MMS's DQA Guidelines are available at http://www.thecre.com/quality/20020210_doi-minerals.html.

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While the Response states that MMS is not preparing a Draft ITA, it acknowledges that MMS has petitioned the National Oceanic and Atmospheric Administration Fisheries ("NOAA Fisheries") "to develop regulations that will specify how seismic operations must be conducted in the Gulf of Mexico."² The Response also describes research and studies that MMS is conducting or following that are relevant to these regulations. According to the Response, MMS agrees it must ensure that this research and these studies meet the DQA quality standards before MMS uses, relies on, or otherwise disseminates them.

For example, the Response states that, "MMS Continually Complies with its Information Quality Guidelines," adding that

"MMS exercises great care with the information and issues surrounding the effects of noise on marine mammals and is, accordingly, using rigorous standards of risk assessment. We rely (and have relied) on the best available science conducted by independent scientists in accordance with objective scientific practices, using standard accepted methodology."³

The Department of Interior's DQA guidelines require that MMS "maintain an administrative record of review procedures" the agency applies to ensure compliance with the DQA guidelines during its work on the effects of sound on marine mammals.⁴ We ask that you inform us where we can obtain this "administrative record" of MMS's DQA pre-dissemination review procedures for the marine mammals acoustic effects issue in the Gulf.

CRE compliments MMS on its current efforts to meet the DQA pre-dissemination review requirements. We believe the attached White Paper will assist the Agency because it discusses the pre-dissemination review process used by other agencies. The Department of Transportation ("DoT") and the Environmental Protection Agency ("EPA") are among the agencies leading the development of pre-dissemination review under the DQA. The DoT and EPA DQA Guidelines each contain important elements of a reliable, effective pre-dissemination review process. We believe the outstanding elements of these agency guidelines should be adopted or adapted by MMS to the extent they are not already included in MMS's current pre-dissemination review process.

In particular, pre-dissemination review should encompass the following steps. These steps are presented in temporal order. They are taken from the flow chart included with the

² Response, at p. 1.

³ Response, at p. 3

⁴ DOI DQA Guidelines II, II. 5., available online at <http://www.doi.gov/ocio/guidelines/515Guides.pdf>

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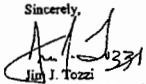
attached White Paper, which discusses each step in detail. All of these steps in the review process should be completed before dissemination of any information.

1. **Review and Consultation**-- For each information dissemination, MMS should review its data and research needs, and consult with stakeholders regarding those needs.
2. **Compliance Verification**-- MMS should review data and analyses to be used, relied on or endorsed to ensure they meet the IQA quality, objectivity, utility and integrity standards.
3. **Influential Information**--MMS should review "influential scientific, financial, or statistical information" for compliance with the more stringent IQA standards that apply to such information.
4. **Ensure Information Fulfills Agency Intentions**--MMS should ensure that the data and analyses support the agency's conclusions and are consistent with the agency's intent in disseminating the information.
5. **Provide Data and Models**--all data and models used, relied on or endorsed in the disseminated information should be made publicly available.
6. **Perform Especially Rigorous Robustness Checks**--any data and models that are not publicly available must pass especially rigorous robustness checks.
7. **Record of Pre-dissemination Review**--MMS should document its pre-dissemination review in the administrative record for the information dissemination.

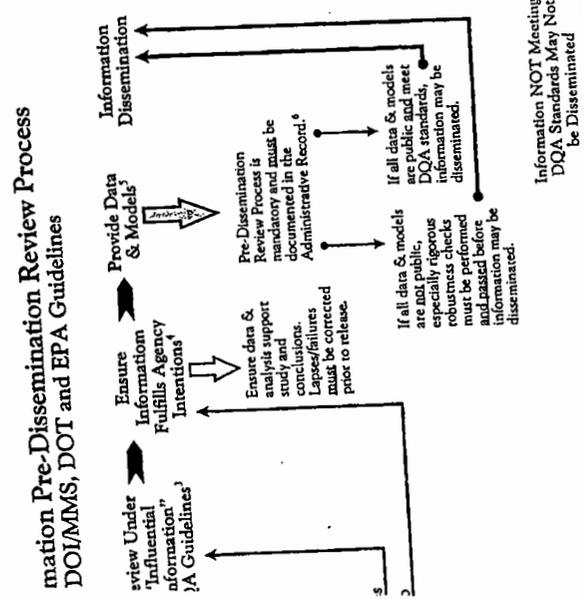
CRE and EPA representatives recently discussed the DQA pre-dissemination review process at the MMS-sponsored International Marine Environmental Modeling Seminar. We are submitting to you a copy of CRE's written materials for the MMS seminar.

Center for Regulatory Effectiveness

Thank you for your consideration. We look forward to discussing this matter with you and other appropriate Agency representatives.

Sincerely,

 John J. Tozzi
 Member, CRE Board of Advisors

Attachments
 CC w/Attachments
 Robert LaBelle
 Deputy Associate Director for
 Offshore Minerals Management



**CRE WHITE PAPER
ON MMS PRE-DISSEMINATION REVIEW
UNDER THE DATA QUALITY ACT**

I. INTRODUCTION

The Center for Regulatory Effectiveness ("CRE") submits this White Paper on pre-dissemination review under the Data Quality Act ("DQA") for consideration by the United States Department of the Interior and the Minerals Management Service ("MMS").¹ Unless otherwise required by context, DOI and MMS will be referred to collectively as "DOI/MMS."

This White Paper is submitted pursuant to MMS's request for comments "at any time" on MMS's implementation of the DQA through the Agency's DQA Guidelines.²

DOI/MMS, the Department of Transportation ("DOT"),³ and the Environmental Protection Agency ("EPA")⁴ are among the agencies leading the development of pre-dissemination review under the DQA. The DOI/MMS, DOT, and EPA DQA Guidelines each contain important elements of a reliable, effective pre-dissemination review process. The outstanding elements of each agency's guidelines should be combined into a comprehensive pre-dissemination review process that ensures the dissemination of high quality information.

To achieve this goal, DOI/MMS should issue guidance establishing the pre-dissemination review process discussed below and visually depicted in the accompanying flow chart.⁵ The steps in this process are presented and discussed in temporal order. CRE recommends that these steps in the review process should be completed before the dissemination of any information by the agency. In that our recommendations are based on the "best of the

¹ The DQA is codified at 44 U.S.C. 3516 Historical and Statutory Notes.

² The MMS DQA Guidelines are available at <http://www.mms.gov/qualityinfo/PDF/MMSQualityInfoGuidelines-Final-SolChanges.pdf>. The request for comments is on page 1 of the Guidelines. CRE's comments on DOI's and MMS's original DQA Guidelines are available at http://www.thecrs.com/quality/20020614_crs-doi.html (DOI) and http://www.thecrs.com/quality/20020910_crs-mineral.html (MMS).

³ The DOT's DQA Guidelines are available at <http://dmses.dot.gov/submit/DataQualityGuidelines.pdf>.

⁴ The EPA DQA Guidelines are available at <http://www.epa.gov/quality/information/guidelines/>.

⁵ Tab 2 to CRE's *Pre-Dissemination Review Under the Data Quality Act*.

and models that are not publicly available, then DOI/MMS should ensure that the data and models pass especially rigorous robustness checks, and DOI/MMS should document their robustness checks in the administrative record.¹¹

7. **Record of Pre-dissemination Review**—DOI/MMS should document their pre-dissemination review in the administrative record for each information dissemination.¹²

These and other CRE comments on specifics of the pre-dissemination review process are discussed in detail below. First, however, we discuss the general pre-dissemination review requirements imposed by the DQA, by the Office of Management and Budget's ("OMB") government-wide DQA guidelines, and by DOI/MMS's own DQA guidelines.

II. GENERAL DQA PRE-DISSEMINATION REVIEW REQUIREMENTS

The DQA requires OMB to "issue guidelines under [the Paperwork Reduction Act, 44 U.S.C. §§ 3504(d)(1), 3516] that provide policy and procedural guidance to Federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by Federal agencies in fulfillment of the purposes and provisions of [the Paperwork Reduction Act]."¹³

The DQA further states that OMB's government-wide guidelines "shall...require that each Federal agency to which guidelines apply...issue guidelines ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by the agency by not later than 1 year after the date of issuance of the [OMB government-wide guideline]."¹⁴

Pursuant to the Statute, OMB has issued government-wide DQA Guidelines. These OMB Guidelines require that agencies establish a pre-dissemination review process to "substantiate the quality of the information [the agency] has disseminated."¹⁵ In discussing the need for the pre-dissemination review process, OMB emphasizes, "Agencies shall treat information quality as integral to every step of an agency's development of information,

¹¹ See White Paper, at p. 10 for a detailed discussion of this component.

¹² See White Paper, at p. 11 for a detailed discussion of this component.

¹³ 44 U.S.C. § 3516 Historical and Statutory Notes, Section (a).

¹⁴ *Id.*, Section (b).

¹⁵ 67 FR 8459 (Feb. 22, 2002).

best"—i.e., they are presently being used by one or more agencies—we do not believe their adoption will cause any unreasonable burden.

We have identified seven components which are essential elements of the DOI/MMS, DOT and EPA pre-dissemination review process. We recommend that these seven components all be incorporated into the DOI/MMS pre-dissemination review process.

Below, we describe the central thrust of each component, but obviously each component will have to be expanded and adapted to the totality of issues confronting DOI/MMS.

1. **Review and Consultation**—For each information dissemination, DOI/MMS should review their data and research needs, and consult with stakeholders regarding those needs, early and often during the development of information to be disseminated.⁶
2. **Compliance Verification**—DOI/MMS should ensure that all data and analyses in disseminated information meet the DQA quality, objectivity, utility and integrity standards.⁷
3. **Influential Information**—DOI/MMS should ensure that all "influential scientific, financial, or statistical information" in disseminated information complies with the more stringent DQA standards that apply to such information.⁸
4. **Do the Data and Analyses Support the Agency's Conclusions and Fulfill the Agency's Intentions**—DOI/MMS should ensure that the data and analyses in disseminated information support DOI's and MMS's conclusions and are consistent with the agency's intent in disseminating the information.⁹
5. **Transparency/Provide Data and Models**—DOI/MMS should ensure that all data and models in the disseminated information are publicly available.¹⁰
6. **Perform Especially Rigorous Robustness Checks**—If DOI/MMS use any data

⁶ See White Paper, at p. 5 for a detailed discussion of this component.

⁷ See White Paper, at p. 6 for a detailed discussion of this component.

⁸ See White Paper, at p. 8 for a detailed discussion of this component.

⁹ See White Paper, at p. 9 for a detailed discussion of this component.

¹⁰ See White Paper, at p. 10 for a detailed discussion of this component.

including creation, collection, maintenance, and dissemination."¹⁶

Pursuant to the Statute, DOI and MMS have issued their own IQA guidelines. With regard to pre-dissemination review, DOI's DQA Guidelines state:

"All information disseminated by the Department must comply with basic standards of quality to ensure and maximize its objectivity, utility, and integrity."

"Before disseminating information to members of the public, the originating office within the Department must ensure that the information is consistent with the OMB, Departmental, and bureau or office guidelines and must determine that the information is of adequate quality for dissemination and maintain an administrative record of review procedures. If the information is influential, the Department will provide for more rigorous review of the conclusions than the review performed by the originating office. Each Department component must identify for the Department's Assistant Secretary-Policy, Management and Budget a designated official who is accountable for information quality."¹⁷

MMS's DQA Guidelines elaborate on these pre-dissemination review requirements:

"To the greatest extent practicable and appropriate, information we disseminate is internally reviewed for quality—including objectivity, utility, and integrity—before such information is disseminated.

- a. Information we disseminate to the public is normally subject to one or more levels of internal staff or supervisory review for quality before we disseminate the information.
- b. The number of levels of internal quality review applied in a particular case depends on the nature, scope, and purpose of the information to be disseminated. For example, routine reports that may be prepared by staff about MMS's activities or operations may be subject to one or two levels of staff or supervisory review for basic accuracy and completeness before such reports are released to the general public. However, additional levels of internal review, supplementation, clarification, or approval by MMS management may be appropriate to the extent such a report may be intended as the basis for more complicated budgeting decisions, legislative reporting, or regulatory purposes

¹⁶ *Id.*

¹⁷ DOI DQA Guidelines II, II, 5; available at <http://www.doi.gov/ocio/guidelines/515Guides.pdf>

(e.g., to satisfy a need for greater statistical detail or explanation)."¹⁸

Under the DQA pre-dissemination review requirements, MMS must ensure that information disseminated by it meets an "objectivity" standard. This standard imposes requirements on both the presentation and substance of disseminated information:

"Objectivity—presentation—includes whether we disseminate information in an accurate, clear, complete, and unbiased manner.

"(b) In addition, objectivity—substance—involves a focus on ensuring accurate, reliable, and unbiased information."¹⁹

Under the DQA, "influential scientific, financial, or statistical information" is subject to especially rigorous pre-dissemination review requirements.²⁰

III. A MODEL PRE-DISSEMINATION REVIEW PROCESS

The DOT has implemented a pre-dissemination review process that, when supplemented by outstanding components of DOI/MMS's and EPA's DQA Guidelines, provides a model process for pre-dissemination review that should be adopted by DOI/MMS. Each step in this model pre-dissemination review process is discussed below in temporal order.

A. Review and Consultation

DOT's pre-dissemination review process requires that agencies allow "adequate" time for review, consistent with the standards required for the type of information to be disseminated. Thus, agencies need to allow more review time for more significant information. This requirement is fully consistent with OMB's government-wide data quality guidelines which state, "The more important the information, the higher the quality standards to which it should be held."²¹

¹⁸ MMS Guidelines II.

¹⁹ MMS Guidelines VI.3, VI.9.

²⁰ DOI Guidelines, VII.9; MMS Guidelines, VII.9.

²¹ 67 FR 8452.

must be answered 'yes' before the data can be used, endorsed or relied on by the agency. A 'no' answer would violate the DQA Guideline requirement that "[a]ll information disseminated ... must comply with basic standards of quality to ensure and maximize its objectivity, utility, and integrity."²²

Despite this unequivocal verification requirement, DOI's DQA Guidelines state that DOI and MMS can endorse, rely on or use third-party information "that is not verifiable."²³ No federal agency should rely on, use or endorse any information, third-party or otherwise, "that is not verifiable." The DOI and MMS DQA Guidelines should be amended if necessary to state this quality requirement clearly.

Modeling analyses and results must also meet the DQA Quality Standards. EPA, working primarily through its Council for Regulatory Environmental Modeling ("CREM"), is itself a "model" for pre-dissemination review of information from or about models. EPA has developed a Web site that contains easily accessible information on models EPA frequently uses, including information on the models' reliability and accuracy.²⁴ MMS should develop and implement a similar data base for models which MMS frequently uses or on which it frequently relies.

EPA has also developed excellent draft guidance on the development and use of models.²⁵ While the EPA guidance focuses on environmental models, its principles and processes apply equally to other types of models. The draft EPA guidance is lengthy and complex, and it will not be reiterated here, other than to provide EPA's executive summary of its process for ensuring that models are developed and used in a manner that generates information meeting DQA standards:

"This Guidance recommends best practices to help determine when a model, despite its uncertainties, can be appropriately used to inform a decision. Specifically, it recommends that model developers and users: (a) subject their model to credible, objective peer review; (b) assess the quality of the data they use; (c) corroborate their model by evaluating the degree to which it corresponds to the system being modeled; and (d) perform sensitivity and uncertainty analyses. Sensitivity analysis evaluates the effect of changes in input values or assumptions on a model's results. Uncertainty analysis

²² DOI IQA Guidelines II, II.5.

²³ DOI IQA Guidelines V.

²⁴ EPA's models data base is available at http://cfpub2.epa.gov/crem/knowledge_base/knowbase.cfm

²⁵ EPA's draft models guidance is available at http://www.epa.gov/ospercom/library/CREM%20Guidance%20Draft%2012_03.pdf

In addition to requiring adequate time for review, the DOT guidelines impose a positive duty on agencies to consult with stakeholders including, but not limited to, the public, other DOT organizations and State governments.²⁶ The consultation requirement is important for two reasons:

1. **Quality.** Consulting with diverse stakeholders through formal and informal processes will enable the agencies to detect errors, biases and other data quality flaws of which they may not have otherwise been aware. The result of the consultations should be an enhancement of overall data quality. Such data quality-related consultations are particularly important for information developed pursuant to rules which were proposed prior to publication of the Department's guidelines as agencies will not have had the opportunity to consult with stakeholders on data quality issues during the rulemaking.
2. **Transparency.** One of the paramount goals of the DQA is to enhance the transparency of government processes. Such transparency not only helps detect errors but also and equally important, "is that the public will be able to assess how much of an agency's analytic result hinges on the specific analytic choices made by the agency."²⁷ Thus, the guidelines should increase the transparency of the federal decision-making process, at least with respect to decisions based on analysis. Although the OMB and DOT guidelines provide a number of other specific requirements to ensure transparency, by consulting with stakeholders about data quality issues, the Department will further enhance and promote transparency.

B. Compliance Verification

The DOT has a very specific process for verifying that information meets IQA standards before the information is disseminated. Pre-dissemination review by individuals not directly involved in developing the information is recommended and used.²⁸

The DOT verification procedures focus on methods for ensuring that statistical data and analyses are accurate and reliable. Where other types of data and analyses are involved, as in human health and environmental risk assessments, then other types of verification procedures should apply. For example, have the data been generated through tests, sampling or other methods that have been demonstrated to be accurate, reliable and reproducible? This question

²² DOT Guidelines, p. 19.

²³ 67 FR 8456.

²⁴ DOT Guidelines, pp. 1-3 and Appendix A.

investigates the effects of lack of knowledge and other potential sources of error in the model (e.g., the "uncertainty" associated with model parameter values) and when conducted in combination with sensitivity analysis allows a model user to be more informed about the confidence that can be placed in model results. A model's quality to support a decision becomes known when information is available to assess these factors."²⁹

EPA's process for verifying models is also discussed in a paper presented by EPA at the MMS-sponsored International Marine Environmental Modeling Seminar.³⁰ MMS should develop similar verification process for its pre-dissemination review of models, using EPA's draft guidance and IMEMS presentation as "models."

C. Influential Information

Under the DOT, DOI/MMS, and EPA DQA Guidelines, "influential scientific, financial, or statistical information" is subject to especially rigorous pre-dissemination review requirements. The DOI and MMS DQA Guidelines define "influential" information as follows:

[DOI Guidelines] "Influential, when used in the phrase 'influential scientific, financial, or statistical information,' means that the Department can reasonably determine that dissemination of the information will have or does have a clear and substantial impact on important public policies or important private sector decisions. The Department, including all offices and bureaus and the NISC, is authorized to define 'influential' in ways appropriate for it, given the nature and multiplicity of issues for which the bureau or component is responsible."³¹

[MMS Guidelines] "Influential, when used in the phrase 'influential scientific, financial, or statistical information,' means that we can reasonably determine that dissemination of the information will have or does have a clear and substantial impact on important public policies or important private sector decisions. We are authorized to define 'influential' in ways appropriate for us, given the nature and multiplicity of issues for which we are

²⁹ *Id.*

³⁰ Copy attached as Appendix A to this White Paper.

³¹ DOI Guidelines VII.9

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responsible.³³

Under both DOI's and MMS's DQA Guidelines, "influential" scientific information such as environmental or human health risk assessments must meet specified pre-dissemination review requirements:

"With respect to influential scientific information disseminated by the Department, regarding analysis of risks to human health, safety, and the environment, the Department will ensure to the extent practicable, the objectivity of this information by adapting the quality principles found in the Safe Drinking Water Act Amendments of 1996. The Department [DOI] will:

- (a) Use the best available science and supporting studies conducted in accordance with sound and objective scientific practices, including peer-reviewed studies where available.
- (b) Use data collected by standard and accepted methods or best available methods (if the reliability of the method and the nature of the decision justifies the use of the data).
- (c) In the dissemination of influential scientific information about risks, ensure that the presentation of information is as comprehensive as possible, informative, and understandable. In a document made available to the public, specify, to the extent practicable:
 - (i) Each population addressed by any estimate of applicable effects
 - (ii) The expected risk or central estimate of risk for the specific populations affected
 - (iii) Each appropriate upper bound or lower-bound estimate of risk
 - (iv) Each significant uncertainty identified in the process of the risk assessment and studies that would assist in reducing the uncertainty
 - (v) Any additional studies, including peer-reviewed studies, known to the Department that support, are directly relevant to, or fail to support the findings of the assessment and the methodology used to reconcile inconsistencies in the scientific data.³³

D. Do the Data and Analyses Support the Agency's Conclusions and Fulfill the Agency's Intentions?

This fourth component of pre-enforcement review concerns the 'big picture.' Do the available data and analyses support the agency's conclusions? Is the proposed agency

³³ MMS Guidelines VI.9

³⁴ DOI Guidelines VII.9; MMS Guidelines, VI.3.

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secrets, intellectual property, proprietary, and other confidentiality protections. In situations where public access to data and methods will not occur due to other compelling interests, we will apply checks to analytical results and document what checks were undertaken. Our guidelines will, however, provide the specific data sources used, and the specific quantitative methods and assumptions we employed unless such information is deemed proprietary. We will define the type of checks, and the level of detail for documentation, given the nature and complexity of the issues.³⁴

"Especially rigorous robustness checks" must be performed and documented in the record in those rare instances where all data, analyses and models are not publicly available. Yet neither DOI nor MMS has defined what "especially rigorous robustness checks" are.

The DOT defines "robustness" with respect to analytical models as follows:

"The 'robustness' of analytical methods is their sensitivity to assumption violation. Robustness is a critical factor in planning and interpreting an analysis."³⁵

EPA's draft model guidance defines "robustness" with respect to models as follows:

"The degree of similarity between calibration data and corroboration data provides a measure of robustness of model performance.... Robustness is defined in this guidance as the capacity of a model to perform equally well across the full range of environmental conditions for which it was designed. The degree of similarity among data sets available for calibration and corroboration provides insight into the robustness of the model. For example, if the dataset used to calibrate a model is identical or statistically similar to the dataset used to corroborate a model, an independent measure of the model's performance has not been provided. In this case, the exercise has provided no insight into model robustness. Conversely, when model outputs are similar to corroboration data that are significantly different from the calibration data, the corroboration exercise provides a measure of both model performance and robustness."³⁶

³⁵ MMS Guidelines, p. 10.

³⁶ Guide to Good Statistical Practice in the Transportation Field (May 2003), pp. 4-8, available on line at http://www.hqs.gov/publications/guide_to_good_statistical_practice_in_the_transportation_field/

³⁷ Footnote 28, *supra* at p. 22.

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dissemination in its current form consistent with the agency's overall intentions and goals? Too often agencies grappling with large and complex factual issues are tempted to release fragments of the total picture without first being sure, or as sure as one can be when dealing with complexity, that the fragment is useful in completing the whole.³⁴

E. Transparency and Robustness Checks

Publicly providing all data and analyses used, endorsed or relied on by the agency ensures that dissemination of information is accompanied by sufficient information to allow stakeholders to determine for themselves whether disseminated information meets DQA standards. This transparency requirement is especially important when third-party studies or data are involved.

The DOI/MMS DQA Guidelines emphasize transparency as a requirement:

[DOI DQA Guidelines] "With regard to analytical results related thereto, Department Information Quality Guidelines shall generally require sufficient transparency about data and methods that an independent reanalysis could be undertaken by a qualified member of the public. These transparency standards apply to Departmental analysis of data from a single study as well as to analysts that combine information from multiple studies. Making the data and methods publicly available will assist in determining whether analytic results are reproducible. However, the objectivity standard does not override other compelling interests such as privacy, trade secrets, intellectual property, and other confidentiality protections."

"In situations where public access to methods and data cannot occur due to other compelling interests the Department, its bureaus and offices, and the NISC shall apply especially rigorous robustness checks to analytical results. The nature of these checks shall be documented. The Department shall require in all cases the disclosure of the nature of the specific data bases used and the specific quantitative methods and assumptions that have been employed. Each bureau and office of the Department and the NISC may define the nature of its checks for robustness and the level of detail for their documentation, in ways appropriate for it given the nature and multiplicity of issues for which the bureau or office is responsible."³⁵

[MMS DQA Guidelines] "Ensuring the data and methods are publicly available will assist us in determining whether analytic results are reproducible. However, the objectivity standard does not override other compelling interests such as privacy, trade

³⁴ DOT Guidelines, pp. 19-20.

³⁵ DOI Guidelines, p. 9.

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We believe that EPA's definition of "robustness" is consistent with sound science, is practicable, and should be adopted, at least with regard to models.

F. Record of Pre-dissemination Review

DOI's DQA Guidelines require MMS to identify in the administrative record the pre-dissemination review procedures that were applied to an information dissemination.³⁹ The DOI IQA guidelines also require MMS to identify a designated official who is accountable for compliance with DQA pre-dissemination review requirements.⁴⁰ These admirable requirements should be copied by other agencies. Their implementation would be aided by identification of the compliance officer in the information dissemination itself, and by stating in the information dissemination itself where the pre-dissemination review can be located.⁴¹

CONCLUSION

CRE compliments DOI/MMS's current efforts to implement the DQA. The purpose of this submission is to recommend a template to DOI/MMS that will make their pre-dissemination review process more explicit and effective, but still consistent with their own existing programs as well as with the process applied by other agencies such as DOT and EPA.

The implementation of some of our recommendations may require DOI/MMS to revise their DQA guidelines, but we believe many of our recommendations could be implemented through issuance of guidance documents.

We look forward to discussing these recommendations with the appropriate DOI/MMS representatives.

³⁹ DOI DQA Guidelines II.

⁴⁰ DOI DQA Guidelines II.

⁴¹ The administrative record should clearly document the DQA pre-dissemination review that has been performed for each information dissemination. The United States Administrative Procedure Act requires that federal agency action be "in accordance with law." 5 U.S.C. § 706(2)(A). The DQA is a law with which most federal agencies must comply when disseminating information. 44 U.S.C. § 3516 Historical and Statutory Notes. Compliance with that law must be demonstrated in the administrative record for the agency dissemination. See generally *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 414, 416-20 (1971).

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Model Transparency at the U.S. EPA

APPENDIX A

MODEL TRANSPARENCY AT THE U.S. EPA

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ABSTRACT:

In its mission to protect human health and safeguard the natural environment, the U.S. Environmental Protection Agency (EPA) often relies on information from models when making regulatory decisions. As part of an ongoing effort to promote model transparency, the EPA, through its Council for Regulatory Environmental Modeling (www.epa.gov/crem), has released two products, the *Draft Guidance for Environmental Models* and the Models Knowledge Base. The *Draft Guidance for Environmental Models* provides advice for model development, evaluation, and application. It recommends best practices to help determine when a model, despite its uncertainties, can be used to inform a decision. The process of model evaluation is of particular importance and can be achieved by: (1) subjecting a model to credible, objective peer review; (2) assessing the quality of input data; (3) corroborating a model by assessing its correspondence with the modeled systems; and (4) performing sensitivity and uncertainty analyses. The companion product, the Models Knowledge Base, is a web-accessible inventory of information on more than 100 of EPA's most frequently used models. The *Draft Guidance for Environmental Models* recommends what information about models to document, while the Models Knowledge Base serves as a repository for this information.

MAIN TEXT:

1. Introduction

The U.S. Environmental Protection Agency (EPA) is charged with protecting human health and safeguarding the natural environment — air, water, and land — upon which life depends (EPA, 2002a). To achieve this mission, the EPA often uses models¹ and their results to inform regulatory decisions. Included in the wide range of models used by EPA are models for atmospheric and indoor air, chemical equilibrium, enforcement, exposure, leaching and runoff, multi-media transport, risk assessment, ground water and surface water, and toxicokinetics. In 2000, the EPA established its Council for Regulatory Environmental Modeling (www.epa.gov/crem) in an effort to improve the quality, consistency, and transparency of EPA models. In the past year, the EPA has released two tandem products from the CREM, the *Draft Guidance for Environmental Models* (EPA, 2003) and the Models Knowledge Base (EPA, 2004). The *Draft Guidance for Environmental Models* provides recommendations for best practices for model development, evaluation, and use. Its companion product, the Models Knowledge Base, is a web-accessible repository where this metadata about model development, evaluation, and use can be documented.

The recommendations presented in the *Draft Guidance for Environmental Models* are drawn from EPA white papers on environmental modeling (EPA, 2001; EPA, 1994), EPA Science Advisory Board (SAB) reports (SAB, 1987; SAB, 1989; SAB, 1993), and peer-reviewed literature. It provides an overview of best practices for evaluating the quality of environmental models. These principles and practices are intended to be generally applicable to all models that are used to inform EPA decisions, regardless of domain, mode, conceptual basis, or form (EPA,

¹ A model is a representation of the behaviour of an object or process, often in mathematical or statistical terms.

2001). In addition, the *Draft Guidance for Environmental Models* includes a comprehensive glossary of frequently used modeling terms.

The intended audience includes model developers, computer programmers, model users, and policy makers who work with models that are used to inform decisions. The *Draft Guidance for Environmental Models* includes an overview of principles for good modeling that is suitable for all users and contains appendices with technical information and examples that are intended for specific user groups. It provides recommendations and suggestions; but, does not create legal rights or impose legally binding requirements on EPA or the public. This paper presents a summary of the *Draft Guidance for Environmental Models* and demonstrates how these best practices for modeling can be documented in the Models Knowledge Base.

2. Model Development

The *Draft Guidance for Environmental Models* describes a four-step process for model development: (1) identify the issue(s) to be addressed; (2) develop the conceptual model; (3) construct the model framework (mathematical model), and (4) parameterize the model to build the application tool. Each step in this process provides opportunities for feedback and iteration. Although uses differ by discipline, in general the term "model" is used to refer to an application tool, while "model framework" describes the system of governing equations. The principles of model development have been developed to complement the systematic quality assurance (QA) project planning for models that is outlined in existing EPA guidance (EPA, 2002b).

The following points summarize the recommendations for model development:

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Model evaluation provides a vehicle for dealing with this problem. The *Draft Guidance for Environmental Models* defines model evaluation as the process used to generate information to determine whether a model and its analytical results are of a quality sufficient to serve as the basis for a decision. In simple terms, model evaluation provides information to assess the following factors (after Beck, 2002a):

1. How have the principles of sound science been addressed during model development?
2. How is the choice of model supported by the quantity and quality of available data?
3. How closely does the model approximate the real system of interest?
4. How does the model perform the specified task while meeting the objectives set by QA project planning?

These four factors address two components of model quality. The first factor focuses on the intrinsic mechanisms and generic properties of a model, regardless of the particular task to which it is applied. In contrast, the latter three factors are evaluated in the context of the use of a model within a specific set of conditions. Hence, it follows that model quality is an attribute that is meaningful only within the context of a specific model application. A model's quality to support a decision becomes known when information is available to assess these factors. Because quality is context-specific, only a decision maker can determine whether a model serves its intended purpose. Information gathered during model evaluation supports the decision maker when formulating decisions and policies that rely on the results of models.

The terms "model evaluation" and "model validation" have different meanings in different disciplines. For example, Suter (1993) found that among models used for risk assessments,

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- Present a clear statement and description (in words, functional expressions, diagrams, and graphs, as necessary) of each element of the conceptual model and the science behind it.
- When possible, test competing conceptual models/hypotheses.
- Use sensitivity analysis early and often (Cullen and Frey, 1999; Saltelli, 2000; Saltelli et al., 2004).
- Determine the optimal level of model complexity by making appropriate tradeoffs among competing objectives.
- Where possible, model parameters should be characterized using direct measurements of sample populations.
- All input data should meet data quality acceptance criteria in the QA project plan for modeling. (EPA, 2002c)

3. Model Evaluation

Because environmental systems are complex, it is difficult to develop complete mathematical descriptions of relevant processes, including all of the intrinsic mechanisms that govern their behavior. Thus, policy makers often depend on models of environmental systems as tools to approximate reality when making decisions. The inherent uncertainty in the approximation of reality produced by models presents a significant challenge for the use of models as the basis for a decision. The question facing model developers and users is to determine when a model, despite its uncertainties, can be appropriately used to inform a decision.

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misconception often arises in the form of the question: "Is the model valid?" and statements such as "no model should be used unless it has been validated." In this context, "validated" means either proven to correspond exactly with reality or demonstrated through experimental tests to make consistently accurate predictions. Because models contain simplifications of reality, model predictions will not correspond exactly with reality and can never be completely accurate. Additionally, "validated models" (e.g., those that have been shown to correspond to field data), do not necessarily generate accurate predictions of reality for multiple applications. Thus, some researchers assert that no model is ever truly "validated," though it can only be invalidated for a specific application (Oreskes et al., 1994). Accordingly, the *Draft Guidance for Environmental Models* focuses on the process and techniques that can be used for model evaluation rather than model validation or invalidation.

As stated above, model evaluation seeks to ensure model quality. At EPA, the concept of quality is defined by the Information Quality Guidelines (IQGs) (EPA, 2002d). The IQGs apply to all information that is disseminated by EPA, including models themselves, input data, and model results. According to the IQGs, quality has three major components: integrity, utility, and objectivity. Objectivity comprises two distinct elements: presentation and substance. Presentation includes whether dissemination of the information is presented in an accurate, clear, complete, and unbiased manner and in a proper context. The substance element focuses on ensuring accurate, reliable, and unbiased information. These elements are emphasized in the *Draft Guidance for Environmental Models* as part of the model evaluation process that addresses the questions listed above.

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The proposed best practices emphasized in the *Draft Guidance for Environmental Models* are: peer review (EPA, 2000) of models, QA project planning including data quality assessment, model corroboration and sensitivity and uncertainty analysis (Beck, 1987; Morgan and Henrion, 1990; Reckhow, 1994). In this guidance, corroboration is defined as a qualitative and/or quantitative evaluation of the accuracy and predictive capabilities of a model. As discussed in previous sections, the process of model evaluation is iterative in nature. Hence, the proposed qualitative and quantitative assessment techniques discussed below may be effectively applied throughout model development, testing and application and should not be interpreted as sequential steps for model evaluation.

4. Model Application

Model Application, (i.e., model-based decision making), is strengthened when the underlying science is transparent via: (1) comprehensive documentation of all aspects of a modeling project and (2) effective communication between modelers, analysts, and decision makers. This transparency encourages a clear rationale for using a model in a specific regulatory purpose.

The *Draft Guidance for Environmental Models* presents best practices and recommendations for integrating the results of environmental models into EPA decisions. Environmental models should provide decision makers with meaningful outputs and enable them to understand the modeling processes that generated these outputs. Decision makers need to understand the relevant environmental processes at a level that is appropriate for the decision of interest. In other words, decision makers should be empowered by being shown the inside of the "black box," as well as its outputs.

central starting point for information about models. Ideally, each model should have its own home page that is managed and updated by its institutional owner. The Models Knowledge Base can serve as a central repository, facilitate model selection, and provide pointers to the home pages for individual models.

Inclusion of a specific model in the Models Knowledge Base is not an endorsement for its use. Models that do not appear in this Models Knowledge Base may also be appropriate for use. EPA recommends that models should only be used for the particular application for which they were designed and only after they have been appropriately evaluated. Decisions about the suitability of a specific model that is included in the Models Knowledge Base for a particular application should be made in consultation with experienced model users (viz. EPA staff, EPA contractors, or staff of other agencies), as necessary.

The Models Knowledge Base facilitates the identification and selection of models with three tools. The visitor can list all available models, perform a keyword search on the models' abstracts, or browse for models by selecting environmental indicators. This last tool, a classification scheme that is adapted from the EPA's hierarchy of environmental indicators, is shown in Figure 1. In this example, the left side of the screen shows that "Clean Water Act" and "Exposure or Uptake" are selected as relevant criteria for a particular modeling activity. The right side of the screen shows all of the models from the Models Knowledge Base that match these criteria. The environmental indicators selection tool is a mechanism to identify models that may be appropriate for particular problems or environmental settings.

The objective of transparency is to enable communication between modelers, decision makers, and the public. Model transparency is achieved when modeling processes are documented with clarity and completeness at an appropriate level of detail. When models are transparent they can be used effectively in a regulatory decision-making process. Documentation enables decision makers and other users of models to understand the process by which a model was developed, its intended application niche, and the limitations of its applicable domain. One of the major objectives of documentation should be the reduction of application niche uncertainty.

5. Models Knowledge Base

The Models Knowledge Base is an inventory of EPA models. In addition to an abstract and contact information for each model, it contains information about model use (What are the requirements?, How can it be obtained?, and How is it used?) and model science (What is the scientific basis for the model?, How was the model developed?, and Was the model evaluated?). The modeling community is encouraged to provide feedback about the Models Knowledge Base and its models.

The Models Knowledge Base was developed in coordination with EPA's program offices and regions. The records in the Models Knowledge base include a spectrum, not a complete set, of models from EPA's various offices. The information in the record for each model was written and reviewed by the appropriate "model owners" in each of these offices. The "model owners" were encouraged to submit graphics for these metadata records and to provide URL links to other sources of information. The records in the Models Knowledge Base are intended to be a

Each model's record includes three pages of information. The General Information page (Figure 2) includes an overview of the model, contact information, and a link to the model's homepage. The second page, Model Use, provides information that is essential for potential users, including technical requirements (hardware, operating systems, and software), directions for obtaining (downloading) the model, and basic information on using the model (model inputs, model outputs, and the User's Guide). The final page, Model Science, includes sections on the conceptual basis of the model, scientific detail, model framework, and model evaluation. These pages are intended to contain the types of information that are recommended by the *Draft Guidance for Environmental Models* and that would be beneficial to prospective model users.

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APPENDIX

None

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FIGURE CAPTIONS

Figure 1. The environmental indicators model selection tool.

Figure 2. The general information page for the Aqtox model's record.

TABLES

None

VITAE

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Data Quality Act Imposes New Requirements on Models Used by Federal Agencies

Before the:
International Marine Environmental Modeling Seminar

October 20, 2004

Scott Slaughter

The Center for Regulatory Effectiveness

APPENDIX B TO

COMMENTS BY THE CENTER FOR REGULATORY EFFECTIVENESS
ON EIS SCOPING FOR GULF MARINE MAMMALS
ACOUSTIC EFFECTS

Overview: The Data Quality Act

- ▶ A recent federal law, the Data Quality Act (DQA) imposes new quality standards which federal agencies must meet before they use, rely on, or endorse models.
- ▶ Federal agencies have to develop a process for ensuring that the models they use meet quality standards.
- ▶ The United States Environmental Protection Agency (EPA) has developed a process for ensuring these DQA quality standards are met.
- ▶ Other agencies, including the Minerals Management Service (MMS), need to implement a pre-dissemination review process for models comparable to the process used by EPA.

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The Center for Regulatory Effectiveness

DQA's Definitions of "Information" and "Dissemination" Apply to Third-Party Data and Models

- ▶ Information is defined as: "any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual forms. This definition includes information that an agency disseminates from a web page..."
- ▶ This definition does not include opinions, where the agency's presentation makes it clear that what is being offered is someone's opinion rather than fact or the agency's views."
- ▶ Dissemination is defined as an: "agency initiated or sponsored distribution of information to the public. Dissemination does not include distribution limited to government employees or agency contractors or grantees; intra- or interagency use or sharing of government information; and responses to requests for agency records under the Freedom of Information Act, the Privacy Act, the Federal Advisory Committee Act or other similar law..."
- ▶ The definitions of Information and Dissemination do encompass model results.

The DQA is Implemented Through OMB and Agency Guidelines

- ▶ The DQA is implemented through:
 1. Guidelines promulgated by the Office of Management and Budget (OMB) that are applicable to virtually all federal agencies.
 2. Agencies subject to the DQA were then required to develop and promulgate their own agency-specific DQA Guidelines.
- ▶ Agency-specific Guidelines must be consistent with OMB's Guidelines and be approved by OMB.
- ▶ OMB and agency-specific DQA Guidelines have been promulgated are now in operation.
- ▶ OMB's government-wide DQA Guidelines, OMB's DQA Guidance and all agency-specific DQA Guidelines are available at <http://theocre.com/quality/agency-database.html>

Third-Party Models Are Subject To the DQA Guidelines

- ▶ Data and/or analyses, including model results, produced by non-agency sources are subject to the DQA guidelines if:
 - An agency disseminates the results in a manner that indicates the agency is using, endorsing or relying on them.
- ▶ In other words, third-party data and/or analyses, including model results, must meet the DQA standards before an agency can use them.

The Department of Interior and Its Minerals Management Service Are Subject to the DQA and Guidelines

- ▶ The Department of Interior's (DOI's) DQA Guidelines are available at http://theocre.com/pdf/20021026_doi-final.pdf
- ▶ An overview of the DQA Guidelines which apply specifically to MMS is available at http://theocre.com/pdf/20021026_mms-overview.pdf
- ▶ The complete MMS-specific DQA Guidelines are available at http://theocre.com/pdf/20021026_mms-final.pdf

MMS' Pre-Dissemination Review Process

- ▶ MMS' agency-specific DQA Guidelines state, in part:
 - "To the greatest extent practicable and appropriate, information we disseminate is internally reviewed for quality—including objectivity, utility, and integrity—before such information is disseminated.
 - a. Information we disseminate to the public is normally subject to one or more levels of internal staff or supervisory review for quality before we disseminate the information.
 - b. The number of levels of internal quality review applied in a particular case depends on the nature, scope, and purpose of the information to be disseminated. ... However, additional levels of internal review, supplementation, clarification, or approval by MMS management may be appropriate to the extent such a report may be intended as the basis for more complicated budgeting decisions, legislative reporting, or regulatory purposes." [emphasis added]

OMB Requires that Agencies Must Ensure That DQA Quality Standards Are Met Before Information Is Disseminated

- ▶ OMB's DQA Guidelines require that agencies establish a pre-dissemination review process to "substantiate the quality of the information [the agency] has disseminated,..."
- ▶ OMB emphasized, "Agencies shall treat information quality as integral to every step of an agency's development of information, including creation, collection, maintenance, and dissemination." [emphasis added]

Pre-Dissemination Review Quality Standards Include: Integrity, Utility, and Objectivity

- ▶ Before agencies disseminate information, they must ensure that the information meets three DQA quality standards:
 - Integrity
 - Utility
 - Objectivity
- ▶ Integrity is defined by the OMB's government-wide DQA Guidelines as:
 - "protection of the information from unauthorized access or revision, to ensure that the information is not compromised through corruption or falsification."
- ▶ Utility is defined by the OMB's government-wide DQA Guidelines as:
 - "the usefulness of the information to its intended users, including the public. ...the agency needs to consider the uses of the information...from the perspective of the public. As a result...the agency must take care to ensure that transparency has been addressed in its review of the information."

DOI Insists that Its Agencies Must Ensure That DQA Quality Standards Are Met Before Information Is Disseminated

- ▶ With regard to pre-dissemination review, DOI's agency-specific DQA Guidelines state:
 - "All information disseminated by the Department must comply with basic standards of quality to ensure and maximize its objectivity, utility, and integrity."
- ***
- Before disseminating information to members of the public, the originating office... must determine that the information is of adequate quality for dissemination and maintain an administrative record of review procedures." [emphasis added]

Influential DOI/MMS Information Requires Especially Rigorous Scrutiny Prior to Dissemination

- ▶ Some information disseminated by agencies is so important that it is classified as "influential."
- ▶ MMS' DQA Guidelines define "Influential" as meaning "that we can reasonably determine that dissemination of the information will have or does have a clear and substantial impact on important public policies or important private sector decisions. We are authorized to define 'influential' in ways appropriate for us, given the nature and multiplicity of issues for which we are responsible." [emphasis added]
- ▶ MMS information designated as "influential" is required by OMB, DOI and MMS to undergo particularly exacting quality review prior to dissemination.

Objectivity: The Most Important Element of the Pre-Dissemination Review Process

- ▶ Objectivity is the most important DQA quality standard.
- ▶ OMB's definition of Objectivity is long and complex. The complete definition may be found at http://fwwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2002_register&docid=R2-59-filed.pdf beginning on *Federal Register* page 8459, column 3.
- ▶ Some key elements of the definition are set forth below:
 - ▶ "Objectivity involves two distinct elements, presentation and substance.
 - ▶ "Objectivity" includes whether disseminated information is being presented in an accurate, clear, complete, and unbiased manner. ... Sometimes, in disseminating certain types of information... other information must also be disseminated... to ensure an accurate, clear, complete, and unbiased presentation. Also, the agency needs to identify the sources of the disseminated information... and... the supporting data and models, so that the public can assess for itself whether there may be some reason to question the objectivity of the sources. Where appropriate data should have full, accurate, transparent documentation, and error sources affecting data quality should be identified and disclosed to users. [emphasis added]

Influential Information: DQA Transparency and Reproducibility Pre-Dissemination Review Standards

- ▶ Influential information is subject to especially rigorous transparency and reproducibility standards under OMB's government-wide DQA Guidelines. The Guidelines, in part state:
 - ▶ "If an agency is responsible for disseminating influential... information, agency guidelines shall include a high degree of transparency about data and methods to facilitate the reproducibility of such information by qualified third parties. [emphasis added]
 - ▶ A. With regard to original and supporting data... agency guidelines shall not require that all disseminated data be subjected to a reproducibility requirement. Agencies may identify, in consultation with the relevant scientific and technical communities, those particular types of data that can practicably be subjected to a reproducibility requirement, given ethical, feasibility, or confidentiality constraints. ...
 - ▶ B. With regard to analytic results... agency guidelines shall generally require sufficient transparency about data and methods that an independent reanalysis could be undertaken by a qualified member of the public. These transparency standards apply to agency analysis of data from a single study as well as to analyses that combine information from multiple studies."

Objectivity: The Most Important Element of the Pre-Dissemination Review Process (continued)

- ▶ In addition, 'objectivity' involves a focus on ensuring accurate, reliable, and unbiased information. ... the original and supporting data shall be generated, and the analytic results shall be developed, using sound statistical and research methods.
 - ▶ i. If data and analytic results have been subjected to formal, independent, external peer review, the information may generally be presumed to be of acceptable objectivity. However, this presumption is rebuttable based on a persuasive showing by the petitioner in a particular instance. If agency sponsored peer review is employed to help satisfy the objectivity standard, the review process employed shall meet the general criteria for competent and credible peer review recommended... to the President's Management Council... (http://www.whitehouse.gov/omb/info/eng/oir_review_process.html), namely, 'that... (d) peer reviews be conducted in an open and rigorous manner.' [emphasis added]

Agencies Must Perform "Especially Rigorous Robustness Checks" For Proprietary Data and/or Models

- ▶ If an agency is legally barred from disclosing models or model results that underlie or form part of an information dissemination, then it must perform "especially rigorous robustness checks" of the data, models, etc., and document those robustness checks in the administrative record for the information dissemination.
- ▶ OMB's DQA Guidelines explain: "Making the data and methods publicly available will assist in determining whether analytic results are reproducible. However, the objectivity standard does not override other compelling interests such as privacy, trade secrets, intellectual property, and other confidentiality protections."
ii. In situations where public access to data and methods will not occur due to other compelling interests, agencies shall apply especially rigorous robustness checks to analytic results and document what checks were undertaken. Agency guidelines shall, however, in all cases, require a disclosure of the specific data sources that have been used and the specific quantitative methods and assumptions that have been employed ... [Emphasis added]

Influential Risk Assessments Must Meet SDWA standards

- ▶ Influential information contained in environmental or human health risk assessments must comply with specified federal regulations:
"With regard to analysis of risks to human health, safety and the environment maintained or disseminated by the agencies, agencies shall either adopt or adapt the quality principles applied by Congress to risk information used and disseminated pursuant to the Safe Drinking Water Act Amendments of 1996 (42 U.S.C. 300g-(b)(3)(A) & (B))."
- ▶ OMB government-wide DQA guidelines cite the SDWA risk assessment standards, in part, as follows:
"an agency is directed...to use '(i) the best available, peer-reviewed science and supporting studies conducted in accordance with sound and objective scientific practices; and (ii) data collected by accepted methods or best available methods..."

DOI/MMS Has Not Defined "Especially Rigorous Robustness Checks"

- ▶ Neither DOI nor MMS has defined or specifically explained the processes and/or standards they will utilize when performing "especially rigorous robustness checks" for proprietary models and data.

Influential Risk Assessments Must Meet SDWA standards (continued)

- ▶ "We further note that ... Congress adopted a basic quality standard for the dissemination of public information about risks of adverse health effects ...the agency is directed, 'to ensure that the presentation...is comprehensive, informative, an understandable.'
The agency is further directed... [to] specify, to the extent practicable: —
(i) each population addressed by any estimate [of applicable risk effects];
(ii) the expected risk or central estimate of risk for the specific populations [affected];
(iii) each appropriate upperbound or lower-bound estimate of risk;
(iv) each significant uncertainty identified in the process of the assessment of [risk] effects and the studies that would assist in resolving the uncertainty; and
(v) peer-reviewed studies known to the [agency] that support, are directly relevant to, or fail to support any estimate of [risk] effects and the methodology used to reconcile inconsistencies in the scientific data."

CONCLUSION: MMS Should Follow EPA's Lead On The DQA and Models

- ▶ EPA has proposed a state-of-the-art pre-dissemination review process for agency use of models.
- ▶ EPA's Guidance on the "Development, Evaluation, and Application of Regulatory Environmental Models" (USEPA 2003), is available online at: http://www.epa.gov/osplibrary/CREM%20Guidance%20Draft%2012_03.pdf
- ▶ Other agencies should implement a similar process.

EPA'S Definition Of Robustness Checks

- ▶ The United States Environmental Protection Agency (EPA) has proposed the following definition of "robustness checks":

"The degree of similarity between calibration data and corroboration data provides a measure of robustness of model performance... Robustness is defined in this guidance as the capacity of a model to perform equally well across the full range of environmental conditions for which it was designed. The degree of similarity among data sets, available for calibration and corroboration provides insight into the robustness of the model. For example, if the dataset used to calibrate a model is identical or statistically similar to the dataset used to corroborate a model, an independent measure of the model's performance has not been provided. In this case, the exercise has provided no insight into model robustness. Conversely, when model outputs are similar to corroboration data that are significantly different from the calibration data, the corroboration exercise provides a measure of both model performance and robustness."

Draft Guidance on the Development, Evaluation, and Application of Regulatory Environmental Models (USEPA 2003), available online at http://www.epa.gov/osplibrary/CREM%20Guidance%20Draft%2012_03.pdf

APPENDIX C TO COMMENTS BY THE CENTER FOR REGULATORY EFFECTIVENESS ON EIS SCOPING FOR GULF MARINE MAMMALS ACOUSTIC EFFECTS

Affected Persons Can Request and Obtain Correction Of Disseminated Information That Does Not Meet DQA Standards

- ▶ Under the law, any "affected person" can request and obtain correction of agency-disseminated information that does not meet DQA quality standards.
- ▶ The request for correction is filed with the agency disseminating the information pursuant to the process the agency has established for such requests.
- ▶ Should a request for correction be denied, each agency has an appeal process. The appeals are not decided by the same official(s) making the original determination.
- ▶ All administrative remedies (request and appeal) must be completed before any potential litigation could be contemplated.
- ▶ MMS' request-for-correction process is available online at pages 6-7 of their Guidelines available as http://theccre.com/pdf/20021026_mms-final.pdf

Model Transparency at the U.S. EPA

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KEYWORD LIST:
Data Quality, Decision Making, Evaluation, Models, Peer Review, Regulations, Sensitivity, Transparency, Uncertainty

ABSTRACT:

In its mission to protect human health and safeguard the natural environment, the U.S. Environmental Protection Agency (EPA) often relies on information from models when making regulatory decisions. As part of an ongoing effort to promote model transparency, the EPA, through its Council for Regulatory Environmental Modeling (www.epa.gov/crem), has released two products, the *Draft Guidance for Environmental Models* and the Models Knowledge Base. The *Draft Guidance for Environmental Models* provides advice for model development, evaluation, and application. It recommends best practices to help determine when a model, despite its uncertainties, can be used to inform a decision. The process of model evaluation is of particular importance and can be achieved by: (1) subjecting a model to credible, objective peer review; (2) assessing the quality of input data; (3) corroborating a model by assessing its correspondence with the modeled systems; and (4) performing sensitivity and uncertainty analyses. The companion product, the Models Knowledge Base, is a web-accessible inventory of information on more than 100 of EPA's most frequently used models. The *Draft Guidance for Environmental Models* recommends what information about models to document, while the Models Knowledge Base serves as a repository for this information.

MAIN TEXT:

1. Introduction

The U.S. Environmental Protection Agency (EPA) is charged with protecting human health and safeguarding the natural environment — air, water, and land — upon which life depends (EPA, 2002a). To achieve this mission, the EPA often uses models¹ and their results to inform regulatory decisions. Included in the wide range of models used by EPA are models for atmospheric and indoor air, chemical equilibrium, enforcement, exposure, leaching and runoff, multi-media transport, risk assessment, ground water and surface water, and toxicokinetics. In 2000, the EPA established its Council for Regulatory Environmental Modeling (www.epa.gov/crem) in an effort to improve the quality, consistency, and transparency of EPA models. In the past year, the EPA has released two tandem products from the CREM, the *Draft Guidance for Environmental Models* (EPA, 2003) and the Models Knowledge Base (EPA, 2004). The *Draft Guidance for Environmental Models* provides recommendations for best practices for model development, evaluation, and use. Its companion product, the Models Knowledge Base, is a web-accessible repository where this metadata about model development, evaluation, and use can be documented.

The recommendations presented in the *Draft Guidance for Environmental Models* are drawn from EPA white papers on environmental modeling (EPA, 2001; EPA, 1994), EPA Science Advisory Board (SAB) reports (SAB, 1987; SAB, 1989; SAB, 1993), and peer-reviewed literature. It provides an overview of best practices for evaluating the quality of environmental models. These principles and practices are intended to be generally applicable to all models that are used to inform EPA decisions, regardless of domain, mode, conceptual basis, or form (EPA,

¹ A model is a representation of the behavior of an object or process, often in mathematical or statistical terms.

2001). In addition, the *Draft Guidance for Environmental Models* includes a comprehensive glossary of frequently used modeling terms.

The intended audience includes model developers, computer programmers, model users, and policy makers who work with models that are used to inform decisions. The *Draft Guidance for Environmental Models* includes an overview of principles for good modeling that is suitable for all users and contains appendices with technical information and examples that are intended for specific user groups. It provides recommendations and suggestions; but, does not create legal rights or impose legally binding requirements on EPA or the public. This paper presents a summary of the *Draft Guidance for Environmental Models* and demonstrates how these best practices for modeling can be documented in the Models Knowledge Base.

2. Model Development

The *Draft Guidance for Environmental Models* describes a four-step process for model development: (1) identify the issue(s) to be addressed; (2) develop the conceptual model; (3) construct the model framework (mathematical model), and (4) parameterize the model to build the application tool. Each step in this process provides opportunities for feedback and iteration. Although uses differ by discipline, in general the term "model" is used to refer to an application tool, while "model framework" describes the system of governing equations. The principles of model development have been developed to complement the systematic quality assurance (QA) project planning for models that is outlined in existing EPA guidance (EPA, 2002b).

The following points summarize the recommendations for model development:

- Present a clear statement and description (in words, functional expressions, diagrams, and graphs, as necessary) of each element of the conceptual model and the science behind it.
- When possible, test competing conceptual models/hypotheses.
- Use sensitivity analysis early and often (Cullen and Frey, 1999; Saltelli, 2000; Saltelli et al., 2004).
- Determine the optimal level of model complexity by making appropriate tradeoffs among competing objectives.
- Where possible, model parameters should be characterized using direct measurements of sample populations.
- All input data should meet data quality acceptance criteria in the QA project plan for modeling. (EPA, 2002c)

3. Model Evaluation

Because environmental systems are complex, it is difficult to develop complete mathematical descriptions of relevant processes, including all of the intrinsic mechanisms that govern their behavior. Thus, policy makers often depend on models of environmental systems as tools to approximate reality when making decisions. The inherent uncertainty in the approximation of reality produced by models presents a significant challenge for the use of models as the basis for a decision. The question facing model developers and users is to determine when a model, despite its uncertainties, can be appropriately used to inform a decision.

misconception often arises in the form of the question: "Is the model valid?" and statements such as "no model should be used unless it has been validated." In this context, "validated" means either proven to correspond exactly with reality or demonstrated through experimental tests to make consistently accurate predictions. Because models contain simplifications of reality, model predictions will not correspond exactly with reality and can never be completely accurate. Additionally, "validated models" (e.g., those that have been shown to correspond to field data), do not necessarily generate accurate predictions of reality for multiple applications. Thus, some researchers assert that no model is ever truly "validated," though it can only be invalidated for a specific application (Oreskes et al., 1994). Accordingly, the *Draft Guidance for Environmental Models* focuses on the process and techniques that can be used for model evaluation rather than model validation or invalidation.

As stated above, model evaluation seeks to ensure model quality. At EPA, the concept of quality is defined by the Information Quality Guidelines (IQGs) (EPA, 2002d). The IQGs apply to all information that is disseminated by EPA, including models themselves, input data, and model results. According to the IQGs, quality has three major components: integrity, utility, and objectivity. Objectivity comprises two distinct elements: presentation and substance. Presentation includes whether dissemination of the information is presented in an accurate, clear, complete, and unbiased manner and in a proper context. The substance element focuses on ensuring accurate, reliable, and unbiased information. These elements are emphasized in the *Draft Guidance for Environmental Models* as part of the model evaluation process that addresses the questions listed above.

Model evaluation provides a vehicle for dealing with this problem. The *Draft Guidance for Environmental Models* defines model evaluation as the process used to generate information to determine whether a model and its analytical results are of a quality sufficient to serve as the basis for a decision. In simple terms, model evaluation provides information to assess the following factors (after Beck, 2002a):

1. How have the principles of sound science been addressed during model development?
2. How is the choice of model supported by the quantity and quality of available data?
3. How closely does the model approximate the real system of interest?
4. How does the model perform the specified task while meeting the objectives set by QA project planning?

These four factors address two components of model quality. The first factor focuses on the intrinsic mechanisms and generic properties of a model, regardless of the particular task to which it is applied. In contrast, the latter three factors are evaluated in the context of the use of a model within a specific set of conditions. Hence, it follows that model quality is an attribute that is meaningful only within the context of a specific model application. A model's quality to support a decision becomes known when information is available to assess these factors. Because quality is context-specific, only a decision maker can determine whether a model serves its intended purpose. Information gathered during model evaluation supports the decision maker when formulating decisions and policies that rely on the results of models.

The terms "model evaluation" and "model validation" have different meanings in different disciplines. For example, Sutcr (1993) found that among models used for risk assessments,

The proposed best practices emphasized in the *Draft Guidance for Environmental Models* are: peer review (EPA, 2000) of models, QA project planning including data quality assessment, model corroboration and sensitivity and uncertainty analysis (Beck, 1987; Morgan and Henrion, 1990; Reckhow, 1994). In this guidance, corroboration is defined as a qualitative and/or quantitative evaluation of the accuracy and predictive capabilities of a model. As discussed in previous sections, the process of model evaluation is iterative in nature. Hence, the proposed qualitative and quantitative assessment techniques discussed below may be effectively applied throughout model development, testing and application and should not be interpreted as sequential steps for model evaluation.

4. Model Application

Model Application, (i.e., model-based decision making), is strengthened when the underlying science is transparent via: (1) comprehensive documentation of all aspects of a modeling project and (2) effective communication between modelers, analysts, and decision makers. This transparency encourages a clear rationale for using a model in a specific regulatory purpose.

The *Draft Guidance for Environmental Models* presents best practices and recommendations for integrating the results of environmental models into EPA decisions. Environmental models should provide decision makers with meaningful outputs and enable them to understand the modeling processes that generated these outputs. Decision makers need to understand the relevant environmental processes at a level that is appropriate for the decision of interest. In other words, decision makers should be empowered by being shown the inside of the "black box," as well as its outputs.

The objective of transparency is to enable communication between modelers, decision makers, and the public. Model transparency is achieved when modeling processes are documented with clarity and completeness at an appropriate level of detail. When models are transparent they can be used effectively in a regulatory decision-making process. Documentation enables decision makers and other users of models to understand the process by which a model was developed, its intended application niche, and the limitations of its applicable domain. One of the major objectives of documentation should be the reduction of application niche uncertainty.

5. Models Knowledge Base

The Models Knowledge Base is an inventory of EPA models. In addition to an abstract and contact information for each model, it contains information about model use (What are the requirements?, How can it be obtained?, and How is it used?) and model science (What is the scientific basis for the model?, How was the model developed?, and Was the model evaluated?). The modeling community is encouraged to provide feedback about the Models Knowledge Base and its models.

The Models Knowledge Base was developed in coordination with EPA's program offices and regions. The records in the Models Knowledge base include a spectrum, not a complete set, of models from EPA's various offices. The information in the record for each model was written and reviewed by the appropriate "model owners" in each of these offices. The "model owners" were encouraged to submit graphics for these metadata records and to provide URL links to other sources of information. The records in the Models Knowledge Base are intended to be a

Each model's record includes three pages of information. The General Information page (Figure 2) includes an overview of the model, contact information, and a link to the model's homepage. The second page, Model Use, provides information that is essential for potential users, including technical requirements (hardware, operating systems, and software), directions for obtaining (downloading) the model, and basic information on using the model (model inputs, model outputs, and the User's Guide). The final page, Model Science, includes sections on the conceptual basis of the model, scientific detail, model framework, and model evaluation. These pages are intended to contain the types of information that are recommended by the *Draft Guidance for Environmental Models* and that would be beneficial to prospective model users.

central starting point for information about models. Ideally, each model should have its own home page that is managed and updated by its institutional owner. The Models Knowledge Base can serve as a central repository, facilitate model selection, and provide pointers to the home pages for individual models.

Inclusion of a specific model in the Models Knowledge Base is not an endorsement for its use. Models that do not appear in this Models Knowledge Base may also be appropriate for use. EPA recommends that models should only be used for the particular application for which they were designed and only after they have been appropriately evaluated. Decisions about the suitability of a specific model that is included in the Models Knowledge Base for a particular application should be made in consultation with experienced model users (viz. EPA staff, EPA contractors, or staff of other agencies), as necessary.

The Models Knowledge Base facilitates the identification and selection of models with three tools. The visitor can list all available models, perform a keyword search on the models' abstracts, or browse for models by selecting environmental indicators. This last tool, a classification scheme that is adapted from the EPA's hierarchy of environmental indicators, is shown in Figure 1. In this example, the left side of the screen shows that "Clean Water Act" and "Exposure or Uptake" are selected as relevant criteria for a particular modeling activity. The right side of the screen shows all of the models from the Models Knowledge Base that match these criteria. The environmental indicators selection tool is a mechanism to identify models that may be appropriate for particular problems or environmental settings.

ACKNOWLEDGEMENTS

The authors appreciate the advice and support of Dr. Paul Gilman, the U.S. EPA's Science Advisor, for his efforts to strengthen the CREM and improve model transparency at the EPA. This paper is partially based on the EPA's *Draft Guidance on the Development, Evaluation, and Application of Regulatory Environmental Models*, a work-in-progress, which is currently undergoing external peer review by the EPA's Science Advisory Board.

APPENDIX

None

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FIGURE CAPTIONS

Figure 1. The environmental indicators model selection tool.

Figure 2. The general information page for the Aqatox model's record.

TABLES

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VITAE

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APPENDIX D TO

COMMENTS BY THE CENTER FOR REGULATORY EFFECTIVENESS ON EIS SCOPING FOR GULF MARINE MAMMALS ACOUSTIC EFFECTS

November 1, 2004

Dr. Terry Schaefer
Silver Spring Metro Bldg. 3
Room 11863
1315 East-West Highway
Silver Spring, MD 20910

Re: NOAA 5-Year Research Plan and 20-Year Research Vision

Dear Mr. Schaefer:

On behalf of the Center for Regulatory Effectiveness ("CRE"), I submit these comments on NOAA's 5-Year Research Plan ("Plan") and 20-Year Research Vision ("Vision").

CRE is concerned that the Plan and Vision contain no reference to the requirements of the Data Quality Act ("DQA") or the Guidelines published by NOAA and the Department of Commerce ("DoC") under the DQA. The DQA and Guidelines establish quality standards that NOAA must meet before it disseminates research to the public. The DQA and Guidelines require that NOAA establish a pre-dissemination review process to ensure these quality standards are met. CRE recommends that the Plan and Vision be revised to include express reference to the DQA and Guidelines, and to discuss the pre-dissemination review process that NOAA employs to ensure compliance.

All agencies must treat information disseminations in a manner consistent with the Office

The DQA is codified at 44 U.S.C. § 3516 historical and statutory notes. The DOC Guidelines are available at http://www.osec.doc.gov/eio/oi/pr/igw.html. The NOAA Guidelines are available at http://www.noaa.gov/newsroom/stories/iq.htm.

Center for Regulatory Effectiveness

of Management and Budget's ("OMB") government-wide DQA Guidelines. The OMB Guidelines require that agencies establish a pre-dissemination review process to "substantiate the quality of the information [the agency] has disseminated..." In discussing the need for the pre-dissemination review process, OMB emphasizes, "Agencies shall treat information quality as integral to every step of an agency's development of information, including creation, collection, maintenance, and dissemination."

The DoC Guidelines emphasize that the Department's "goal is to ensure and maximize the quality of information we release to the public. We are committed to making the methods, models, and processes that produce our information transparent and rigorous."

NOAA's own Guidelines confirm the agency's commitment to pre-dissemination review to ensure compliance with the DQA quality standards:

"Information quality is composed of three elements — utility, integrity and objectivity. Quality will be ensured and established at levels appropriate to the nature and timeliness of the information to be disseminated. Information quality is an integral part of the pre-dissemination review of information disseminated by NOAA."

CRE commends NOAA for its commitment to DQA pre-dissemination review. CRE recommends that the Plan and Vision include an express statement of that commitment, and that they explain the pre-dissemination review process that NOAA employs.

Attached to these comments is a written outline of CRE's recent presentation at the International Marine Environmental Modeling Seminar. The IMEMS seminar was sponsored by the U. S. Minerals Management Service. CRE joined representatives of U.S. Environmental Protection Agency in a discussion of the DQA pre-dissemination review requirements. We hope



Marine mammal

WAG-HILL ARCTIC SCIENCE, LLC

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Bowhead mysticete

P. Michael Payne, Chief
Marine Mammal Conservation Division
Office of Protected Resources
NMFS (P/PR2)
1315 East - West Highway
Silver Spring, MD 20910

March 17, 2005

Subject: LD 060804F

Dear Mr. Payne:

This letter contains comments regarding your notice (LD 060804F) in the January 11 Federal Register (Pages 1871 - 1875). In the notice you state that the National Marine Fisheries Service (NMFS) will prepare an Environmental Impact Statement (EIS) to analyze the potential impacts of applying new criteria in guidelines to determine what constitutes a "take" of a marine mammal.

The notice says that comments must be received by March 14. Only two days ago this notice came to my attention. Even though my comments are late, I hope that you will still consider them and provide them to whoever will prepare the EIS.

I feel reasonably able to comment upon this subject in view of my 22 years living and working in Barrow, Alaska where industrial noise as a disturbance to bowhead whales is a major concern to the Eskimo people who depend upon that animal. During most of my time in the Alaskan Arctic, I was Senior Scientist in the Department of Wildlife Management of the North Slope Borough. I also had the good fortune to provide technical advice to the Alaska Eskimo Whaling Commission (AEWC) and to the Barrow Whaling Captains Association (BWCA). I retired from these duties in September 2001.

In the notice you mention the need for good data and that the EIS will utilize sound scientific data. In view of this, I ask you (and the EIS preparers) to give attention to the data discussed and cited below. Sound scientific data already available show that fall migrating bowheads are greatly impacted at received levels far BELOW the 160 dB proposed in your notice.

- I. Bowhead whale data related to offshore DRILLING.

1 67 FR 8459 (Feb. 22, 2002).

2 Id.

3 DoC Guidelines, "Commerce Commitment to Information Quality"

4 NOAA Guidelines, Part II.

During the 1986 open water drilling operation (drillship) in the Alaskan portion of the Beaufort Sea there are data to show that fall migrating bowhead whales showed displacement at noise levels near the whales of much less than 160 dB.

1.1 For example, at the Hammerhead drilling site no whales were detected closer than 6 miles (9.5 km) to the drillship and few were detected closer than 9 miles (15 km). One bowhead was seen (via aerial survey) over 6.8 hours to move in an arc around the drillship, staying about 15 miles (25 km) from the drillship. See page 47 of Integration and Summary section of LGL and Greeneridge 1987. While there were no specific received level data at the whales, during the September 20 - October 10 period received levels at 6 miles (11 km) from the drillship were generally 105-130 dB (see Fig. 13 on page 31 of Integration and Summary section of the 1987 LGL and Greeneridge report). It has been a long time since I looked at this very good report, but I think the page numbers I mention are correct. See also page 100 of NRC 2003.

2. Bowhead whale data related to offshore SEISMIC exploration. During the open water season in 1996, 1997, 1998 there were very good studies showing the reactions of fall migrating bowhead whales to the noise from marine seismic exploration vessels in the Alaskan portion of the Beaufort Sea. The data clearly showed that the bowheads avoided areas with much less than 160 dB.

2.1 The three studies that clearly show bowhead avoidance at MUCH LESS than 160 dB are Richardson 1997, 1998 and 1999. These studies show that without doubt, nearly all fall migrating bowheads stay 12 miles (20 km) away from an operating seismic vessel. As an example, refer to Figure 5.14 (parts G and H) on page 5-47 of Richardson 1999. This figure shows combined bowhead sightings data for 1996, 1997 and 1998 around a seismic vessel when quiet and when operating ("booming"). The figure clearly shows near total avoidance of an area within 12 miles radius (20 km) of the active seismic vessel.

An indication of received levels at the edge of the 12 mile (20 km) radius exclusion zone can be found by examining received level data as presented in Figure 3.30 on page 3-53 of Richardson 1999. These data show received levels at 12 miles (20 km) from the working seismic vessel of SEL from about 90 dB to 125 dB with most RL values in the 100 dB to 110 dB area. See also page 100 of NRC 2003.

2.2 While there are crystal clear data to show that seismic noise causes near total avoidance at 12 miles (20 km) (about SEL 90 dB to 125 dB RL; see Figure 3.30 on page 3-53 of Richardson 1999) there is evidence that bowheads begin to be deflected at 21 miles (35 km) from the active seismic boat (see pages 5-59 and 5-60 and 5-78 and 5-87 and 5-101 of Richardson 1999). See also page 100 of NRC 2003.

Received levels (SEL) at 21 miles (35 km) are from about 80 dB to 125 dB with most values between 80 dB and 100 dB (see Figure 3.30 on page 3-53 of Richardson 1999).

1989). Hopefully, the EIS preparers will carefully consider the comments of the Eskimo hunters who will be affected by proposed weakening of the noise regulations. When the EIS preparers consider comments from hunters it is important that the EIS preparers give due weight to the hunter comments. Over the past years it often seems to happen that Eskimo hunter comments are "listened to" but are given little credence since hunter comments are not "scientific". For those who may seek to "dismiss" hunter comments they should carefully consider the value of such Traditional Knowledge (TK) as it relates to the bowhead whale. The EIS preparers (before possibly dismissing hunter comments) need to recognize that major aspects, of hunter related TK of the bowhead, have been fully validated through at least 20 years of scientific studies (Albert 2001). Since major aspects of Eskimo Traditional Knowledge related to the bowhead whale have been validated, the EIS preparers must consult with the people (Eskimo hunters) most likely to be impacted by any proposed weakening of regulations related to industrial noise in the Beaufort Sea.

4. I hope that these comments are helpful to you, and to the preparers of the Environmental Impact Statement (EIS), in considering the potential impacts of applying new criteria in guidelines to determine what constitutes a "take" of a marine mammal due to industrial noise.

As mentioned above, I regret getting these comments to you after the due date, however, I do hope that you and the EIS preparers will at least give them some consideration.

Sincerely,
Tom Albert
Thomas F. Albert, V.M.D., Ph.D.

cc. AEWC
BWCA
NSB

2.3 There also are data to show that seismic noise displaced bowheads remain displaced (from normal migratory path) for at least 24-30 miles (40-50 km) to the west of the area of seismic operations. Such data were clearly seen in 1998 (see pages 5-59 and 5-60 and 5-101 in Richardson 1999).

Received levels (SEL) at about 27 miles (45 km) were from about 80 dB to 120 dB with most values between 80 dB and 100 dB (see Figure 3.30 on page 3-53 of Richardson 1999).

NRC 2003 on page 102 states "Available data are inadequate regarding the full effects of industrial noise (seismic noise in particular) on fall migrating bowhead whales in the Alaskan portion of the Beaufort Sea."

2.4 Let me add additional interesting information relating to bowhead whales and their avoidance of seismic noise. Below, I quote several sentences from the DRAFT report from the June 5-7, 2001 meeting of the NMFS sponsored "2001 Open-Water Noise Peer Review Workshop" held at the National Marine Mammal Laboratory (NMML) in Seattle. I can only cite the draft report as I did not receive a finalized version before my retirement in September 2001 from the North Slope Borough (NSB). That report was finalized by NMML personnel (probably Dr. Robyn Angliss).

"In general, we support the methods and results reported in Richardson et al (1999) avoidance of seismic sounds by bowhead whales. To summarize: Monitoring studies of 3-D seismic exploration (8-16 air guns totaling 560-1500 in) in the nearshore Beaufort Sea during 1996-1998 have demonstrated that nearly all bowhead whales will avoid an area within 20 km of an active seismic source, while deflection may begin at distances up to 35 km. Sound levels received by bowhead whales at 20 km ranged from 117-135 dB re. 1µPa rms and 107-126 dB re. 1µPa rms at 30 km. The received sound levels at 20-30 km are considerably lower levels than have previously been shown to elicit avoidance in bowhead or other baleen whales exposed to seismic pulses."

3. Need to consider impact of proposed regulations on subsistence hunt of bowhead whale by Alaskan Eskimo.

Whoever prepares the Environmental Impact Statement (EIS) must take into account the likely impacts of the proposed regulations upon the bowhead whale subsistence hunt. If an alternative is chosen that allows exposure of fall migrating bowhead whales to anything near 160 dB, the available evidence shows that the whales are likely to make a major "detour" around the sound. Any significant deflection of the migrating whales will negatively impact the Eskimo subsistence hunt for the whales.

To get some idea of likely impacts to the subsistence hunt the EIS preparers must consult with the hunters and with their earlier noise related comments, many of which have appeared in Final Environmental Impact Statements (FEIS) related to offshore industrial activities in the Beaufort Sea.

Eskimo hunters have been complaining about industrial noise impacts to their bowhead subsistence hunt since the 1980s (for example, see Ahlmaogak 1985, 1986 and

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From "Michael Stocker"
Date Thursday, January 20, 2005 10:41 pm
To <AcousticEIS.Comments@noaa.gov>
Subject Revised written comments
Attachments Ocean Noise Criteria - NMFS Scoping Jan 2005.doc 184K
The attached first citation in my written comments were revised. All other text remains the same.

Michael Stocker
Seaflow Science Advisor
Comments of on the National Marine Fisheries Proposed Action for
Ocean Noise Criteria
January 18, 2005

1.0 Overview

As we become more familiar with the mysteries of ocean life, and particularly with ocean animal perception, it makes sense to adapt our uses of ocean habitat to reflect our greater understandings of ocean life. In light of this, the idea of replacing the current MMPA "Harassment Level" guidelines with more closely tailored "Ocean Noise Criteria" seems like a good idea. But it is important to not craft any new guidelines too hastily - merely to find a place to land as we abandon what we know to be an inadequate system.

The current system is clearly lacking because it bases acceptable levels of noise pollution for all marine habitats predicated on what we know about the auditory perception of a few cetaceans. While this current system has served as a legislative tool to protect marine mammals from injury or death due to acoustic trauma, it has failed on a number of accounts.

1
Firstly: the current system models acceptable noise levels based on scant scientific information - derived largely from captive studies of small odontocetes,¹ and quantifiable observations and assumptions about the behavior of larger cetaceans.

Secondly: The current system is based in large part on organic damage to the subject animals, such as temporary and permanent threshold shifts.

Thirdly: No account is made for the synergistic and cumulative effects of noise incidents on the subject species.

Fourthly: No accommodation is made for the fact that other animals in the ocean use sound and are also subject to acoustical damage due to anthropogenic sound.

2
The propose NMFS action to finely tune "Ocean Noise Criteria" to specific species only embellishes the current blunt tools to suit human use of ocean habitats. This flies in the face of the US Commission on Ocean Policy report recommendations to develop an "ecosystem" approach to ocean management.

2.0 Developing an Ocean Noise Criteria

3
Rather than basing a new regime of Ocean Noise Criteria on the existing standards, a workable ocean noise criteria should be developed to incorporate our growing understanding of the complex adaptations that various animals have to their habitat. They would account not only for how specific animals respond to acoustical stimulus in the presence of testing procedures, but also account for how the animal operates within their subject environment.

These criteria could be similar to the architectural noise criteria (NC) that frame acceptable noise levels for various human-habitable spaces.² For example, libraries and churches have a much lower noise criteria than schoolrooms and office spaces, which in turn are lower than high-volume restaurants and sports facilities. The determining factors in architectural noise criteria include the uses of the spaces, how many people will be simultaneously using them, and what type of communication, activity, focus and concentration is required in each space.

Similar considerations could be used in establishing ocean noise criteria, which would include elements of both human/mechanical uses and natural/biological needs of the subject environments. For example, the noise criteria in harbors and shipping channels would be necessarily higher than the noise criteria of coastal reef areas or kelp forests, and noise criteria around oil drilling platforms would be handled differently than noise criteria in productive fishing grounds.³

3
Architectural noise criteria are established from two standpoints; the ambient noise within the environment, and the noise contribution of noise sources within the environment. Bringing these two standpoints together helps establish the noise criteria of the space, and provide guidelines for the introduction of noise sources into that space. For example, "NC-35" is a suitable noise criteria for a library (-45dBA re: 20µPa),¹ and the noise level for a pinball machine can range between 65dBA and 80dBA (re: 20µPa). It would be a bad idea to put a pinball machine within the walls of a library as it would exceed the noise criteria of the library. Similarly if a coastal reef area has a (hypothetical) Ocean Noise Criteria of "ONC 120," it would be a bad idea to use explosive seismic air guns with a source level of 220 dB in this area.

2.1 Noise Criteria based on ambient noise

Determining the appropriate noise criteria for a given marine area will be challenging because the ocean is a complex acoustic environment. Sound works in perplexing ways in the ocean, and we have yet to understand even some of the rudimentary manners in which animals have acoustically adapted to it. Fundamentally we would like to avoid introducing noise levels that are damaging to animal hearing. The presence of exceedingly loud natural sounds such as the grinding of polar ice, lightning strikes, marine earthquakes and the vocalizations of whales tempt us to use these noise levels as acceptable benchmarks for basic noise levels.⁴ These natural marine noises can in some cases be heard for hundreds to thousands of miles away, and at the source may exceed 220 dB. But ocean animals have adapted to these sounds, and the natural acoustical signatures have been worked into the animals' biological adaptations. Meanwhile, human generated noises are a new feature in the ocean; it has only been in the last ~60 years that continuous drone of engine noise, or long periods of high repetition seismic air-gun explosions have been saturating the marine environment.⁵ While these new noises may be

¹ By convention, all airborne sound levels in this paper are re: 20 microPascal, and all underwater decibel levels are referenced to 1 microPascal.

just as loud and pervasive as grinding polar ice or earthquakes, marine animals are not biologically adapted to them. The impact of these new noises may not be readily apparent to our observation, and it is likely that they clutter the natural bio-acoustic niches, masking the organic sounds that sea animals otherwise depend on for their survival.

The current practice of noise regulation was not specifically developed to address the impacts of noise on marine mammal, rather it is a byproduct of biological "harassment levels" for marine mammals from the Marine Mammal Protection Act, based on either biological damage (Level A) or behavioral disturbance (Level B).⁶ While this strategy set the stage for discussions on ocean noise, it is a strategy that frames ocean noise levels based on the maximum permissible levels against acceptable levels biological compromise.⁷ Using similar benchmarks of behavioral disturbance or biological damage to humans for architectural noise criteria would be neither useful nor acceptable to us.

In current architectural practice, 'noise criterion' is framed by acceptable noise levels that do not interfere with specific activities. Adopting ocean noise criteria based on biological use of an area's acoustical niches would more closely match architectural noise criteria and would ultimately prove more useful. These noise criteria would be informed by noise levels that mask or interfere with important bio-acoustic cues that ocean animals rely on to breed, feed, avoid prey, and communicate.

While these benchmarks may not be readily determined by observing unambiguous avoidance behavior of animals in their habitat, workable thresholds could initially be established from behavioral studies and audiograms of known species, and then integrated into noise criteria models. MMPA Level B Harassment suggests a starting point,⁸ as it involves observable behavior rather than tissue damage. The shortcoming of this field metric is that does not consider chronic stress and long term habitat degradation - conditions that have not been fully factored into slow recovery of fish and marine mammal stocks. In human habitat, the creeping rise in ambient noise levels is implicated in increased stress. Effective ocean noise criteria might include the fact that other animals respond in a similar manner to increased noise.⁹

If architectural noise criteria model is used, the natural ambient noise levels might be used as a baseline, and acceptable levels above that would depend on the form factor of the introduced noise; e.g.: whether the mechanical noise is impulse, occasional, periodic or continuous. Each of these forms will influence the biota in different manners. The challenge here is that we know very little about how various ocean animals perceive or integrate ambient and action-specific sounds. Given what little we do know, perhaps the best we can do for now is use our own perceptions as a benchmark. We know that continuous noises that are 15 - 20dB above ambient will begin to compromise our ability to communicate, though we can tolerate occasional impulse noises well above that level.

A similar 'margin' could be used as a trigger point for environmental assessment. For example, if the contributed noise of a continuous noise source (such as a navigation beacon) exceeds 15 dB over the natural ambient noise levels, it might trigger a requirement an environmental impact assessment (EIA). On the other hand, periodic or occasional noises such as the passage of vessels would not require an EIA because their

'occasional' characteristic would not be as regionally disruptive and thus could be regulated under a higher noise level trigger point.

The evaluation of ambient noise levels naturally intersects the biological productivity of an environment. Environments that are biologically productive will of course feature a higher ambient noise level than areas that are biologically sparse. Biologically productive areas will also be more vulnerable to introduced anthropogenic noise, so some biological scaling factors need to be integrated into acceptable noise levels.

One method of achieving 'biologically scaled' noise criteria for various areas of the sea would be to take the commonly understood divisions of the ocean and profile their 'typical' bio-acoustic activity. Coastal estuaries, bays and reefs, through to outer coastal waters, the outer continental shelf and on to the deep ocean all have their own unique biota. These areas can be bio-acoustically "profiled." These profiles can then be integrated into criteria such as "biological productivity," species diversity and diffusion, and biological stability to determine the resilience of the habitat. Bio-acoustic profiles could then be integrated into the other characteristics that are used to qualify "Offshore Biologically Important Areas" (OBIA)¹⁰ and "Marine Protected Areas" (MPA's).¹¹

The main objective here is to set up a protocol of establishing Ocean Noise Criteria based on the workings of the environment rather than the tolerance of various individual organisms that reside in it.

2.2 Noise Criteria of introduced noise sources.

As acceptable ambient noise criteria are established for a given areas, the allowable levels of introduced noises can be set. In order for this to occur, profiles of various noise sources need to be determined. Again the complexity of marine acoustics presents a challenge here. As sound propagates so effectively in water, metric standards need to be devised that reflect an array of conditions. Stationary sources need to be treated differently than moving sources; deep diving noise sources will involve different metrics than shallow water noise sources; propagation patterns accounting for size also add to the complexity. For example, it might make sense to measure the sound of a Low Frequency communication system at 1 km, whereas it would not make sense to use this same standard for a personal watercraft.

Introduced noise profiles need to be drawn up in consideration of frequency spectrum, amplitude, radiated noise pattern, periodicity, saturation depth, and finally, the probable "receive levels" of the subject animals in their operating habitat(s). Given the vast array of noise sources – from deep-water vessels to acoustical modems, from fish finding sonars to seismic airgun exploration; establishing measurement standards will be a daunting task. Measurement standards for airborne noise sources are involved and often require standardized testing environments such as anechoic chambers and isolation rooms. Measuring each marine technology in a 'standardized environment' and plotting their noise profiles in X, Y, Z, and time vs. noise could prove daunting. Measuring a specific technology in their typical operating environment might prove less daunting and a more useful strategy. Perhaps professional organizations such as the Acoustical Society

This may explain why some fish (and some mollusks) can endure loud continuous noise and large impulse noise, but not survive lower flux density, faster rise time impulse or transient sounds.

In the sound pressure dimension, this disparity in integration might be compared to the human ability to adapt to extreme noise levels (of a jet engine when they are on the tarmac, for example) but would probably be debilitated if this same noise level occurred in their living room.

This is not to suggest that "energy flux density" be abandoned, rather it speaks to the need for expanding the inquiry into the complexities of ocean sound perception.

3.0 Summary

The development of "Ocean Noise Criteria" has been long needed, thus the proposed NMFS action is timely. Unfortunately the proposed action outlined in the proposal both falls short of what is needed, and heads off in the wrong direction. For an ocean noise criteria to be effective, it would need the following provisions:

1. It would need to be based on ecosystem considerations, not just focused individual species responses.
2. It would need to include the impacts of noises on fish and marine invertebrates,
3. It would need to include synergistic and cumulative effects on marine animals.
4. It would need to include "energy flux density" and have provisions for other energy-time-domain integration as research yields more clarity on marine animal sound perception.
5. It would need to evaluate and set appropriate noise levels, incorporating human and animal uses of various habitats – with a focus on sustainability.
6. It would need to be precautionary (as to the potential damage to subject animals) and not based on thresholds of biological damage (such as TTS or PTS).
7. It would need to be open and flexible to incorporate advances in marine bio-acoustic research and improvements in technology.

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of America¹² or the International Maritime Organization could help set up metric standards.

2.3 Noise Criteria or "NC" curves.

In architectural acoustics, a set of Noise Criteria or "NC" curves exists that help designers and building users determine what type of sound/noise/communication activity is suitable for a given area.¹³ These curves take into account typical noise profiles of particular human activities and are tailored mostly in terms of frequency band energy at a given decibel level. NC curves account for human sound perception across the spectrum and at various volume levels and are thus not "flat" from a spectral standpoint.¹⁴

Ocean areas might also be defined by Ocean Noise Criteria or "ONC" curves – accounting for how humans and other animals use the habitat, the impact of introduced noise to the biota of that habitat, and the biological and economic value of preserving or sacrificing the habitat. In this context, a busy commercial harbor could be defined as an "ONC 160" indicating that introduced noises below, or quieter than the noise criteria curve of "ONC 160" would not need to be mitigated or 'permitted.' Meanwhile a coral reef or kelp forest which might have a "NC 110" rating, would require all continuous activity with a noise profile above NC 110, and all occasional or impulse noises above 125dB to be evaluated for biological impact and/or mitigated.

2.4 Energy Flux Density vs. Sound Pressure Levels

An additional challenge to deriving ocean noise criteria involves perceptual dimensions that occur in marine animals that have no equivalence in terrestrial animal hearing. Most specifically, marine animals have adapted to at least two independent modes of sound transmission in water; sound pressure and particle motion. Terrestrial vertebrates are adapted to sense fluctuations in pressure by way of diaphragms in their organs of hearing. Some marine animals also perceive pressure fluctuations, but many also perceive "particle motion" – or how the physical medium of water is set in motion by acoustical energy, thus impinging on the animals body and organs of particle motion detection. Particle motion is directional and thus has an amplitude and time domain (phase) relationship to pressure gradient energy when generated from the same sound source. Integrating the particle and pressure gradient motion helps a fish determine the scale and direction of oncoming threats.¹⁵

The NMFS action proposes to integrate these properties by the use of "Energy Flux Density"¹⁶ in lieu of sound pressure level. While this metric expands on our understanding of how sound works in water, it does not address how various animals integrate particle and pressure gradient energy into their perceptual surroundings.

Animals may have adapted to high energy flux conditions that depend on circumstances of their surroundings. They may be able to integrate phase differences within a range that would be consistent with the scale, direction and proximity of natural sources of noise. On the other hand, these same animals may be damaged in lower flux densities if the phase information is out of range or inconsistent with their natural biological adaptations.

¹ A recent captive study of a Risso's Dolphin called for a complete revision of the audiograms of this very common species. Paul E. Nachtigall, Michelle M. Yuen, T. Aran Mooney, and Kristen A. Taylor "Hearing thresholds of a stranded infant Risso's dolphin" *The Journal of the Acoustical Society of America* – October 2004 – Volume 116, Issue 4, p. 2532

² "Noise Criteria" are guidelines only. Currently with the exception of the National Institute for Occupational Safety and Health (NIOSH) noise exposure guidelines, the Federal Government does not have any "Noise Criterion" for inhabited spaces. Federal Environmental Noise policy was initially outlined under the Environmental Protection Act of 1972, but was later de-funded under the Reagan administration. Various state, county and city laws exist and do have environmental noise criterion particular to residential, commercial and industrial areas, but these are typically abatement guidelines only.

³ For psychoacoustic guidelines for inhabited spaces, see: Leo Beranek "Acoustics" 1986. Acoustical Society of America, p.417-429.

⁴ "Final Overseas Environmental Impact Statement and Environmental Impact Statements for the Surveillance Towed Array Sensor System Low Frequency Active Sonar." 2001 Dept. of the Navy, Chapters 3 and 4.

⁵ Elena McCarthy "International regulation of Underwater Sound" 2004 Kluwer Press. Chapter 2.5.

⁶ Marine Mammal Protection Act (MMPA) of 1972 Section 3.(16 USC 1362) Definitions p.4.

⁷ The use of the word "takes" in referring to harassment incidents speaks to the pedigree of the idea of harassment.

⁸ Any activity that "has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." See ref. 29

⁹ Arthur N. Popper, Andrew S. Kane, and Michael S. Smith "Biological responses to acoustical stress in fishes" *J. Acoust. Soc. Am.* 112, 2432

¹⁰ "Offshore Biologically Important Areas" or OBIA's were first proposed by NOAA and the Department of the Navy in the Environmental Impact Statement for the SURTASS/LFA system. (see note 25)

¹¹ Federal Register / Vol. 65, No. 105 / Wednesday, May 31, 2000 Executive Order 13158 of May 26, 2000 "Marine Protected Areas"

¹² The Acoustical Society of America has recently established a policy committee to inform policy on various issues. The first two issues of concern to the ASA are Classroom Noise and Ocean Noise.

¹³ See Vern O. Knudsen and Cyril M. Harris "Acoustical Designing in Architecture" 1950 and 1978. Acoustical Society of America, p.199, p.259-260. As indicated in ref. 25, NC curves serves as guidelines only.

¹⁴ "Noise Criteria" or NC curves are a set of sound level curves across audible frequencies that reflect human sensitivity to specific frequency bands and do not directly align with broadband sound pressure levels.

¹⁵ Peter H. Rogers and Thomas N. Lewis Michael D. Gray "Startle reflex in fish" *JASA Nov 1995 Volume 98, Issue 5 p. 2939*

¹⁴ Mardi C. Hastings "Noise exposure metrics for auditory and nonauditory damage in aquatic animals" J. Acoust. Soc. Am. 116, 2533 (2004)



F. Michael Payne,
Chief, Marine Mammal Conservation Division,
Office of Protected Resources,
National Marine Fisheries Service,
1315 East-West Highway,
Silver Spring, MD 20910-3225.

Cc: Dr. William Hogarth
Senator Barbara Boxer (Report attached)
Senator Diane Feinstein (Report attached)
Governor Christine Gregoire (Report attached)

Re: NMFS Report on the USS Shoup Haro Strait/Orca incident

March 21, 2005

Dear Mr. Payne,

I have reviewed the National Marine Fisheries Service report on the Haro Strait incident.¹ While the report does indicate that the noise of the USS Shoup was the "likely" cause of the Orca's "behavioral reactions," according to the NMFS metrics, the noise did not cause any harm.

I believe that this reveals some shortcomings of the NMFS metrics and their associated assumptions on a few accounts.

First, they are based on assessment of biological damage in terms of Temporary Threshold Shift (TTS) and Permanent Threshold Shift (PTS). While TTS and PTS are benchmarks that are continually used for policy decisions, I don't believe that using them reflects a humane concern for the welfare of animals.

Second: The metrics include "Sound Exposure Level" (SEL) that incorporates noise exposure over time (in seconds).² While this metric may more accurately represent the physics of the sound exposure, it does not accurately represent the biological effects of the exposure.

By way of example: If we are instantaneously exposed to a bright flash of light at 30,000 LUX, we would temporarily be blinded. If we ramp the light level up to 30,000 LUX over 20 seconds, our iris would adapt, and if it got too bright, we would close our eyes and thus avoid eye damage. In this example, the "Light Exposure Levels" for the ramped light would be much greater than the "Light Exposure Level" for the bright flash. So by the "Exposure Level" metric, this bright flash would be considered less damaging. This reflects the inaccuracy of the SEL metric in measuring biological impacts of loud noises.

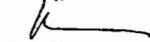
The third shortcoming is that the noise is only considered "noise" and is not framed in terms of the type of noise it is. In this context, Beethoven at 110dB has the same impact as fingernails on chalkboards at 110dB. The distinction here is not aesthetic; given human biological reaction to the "fingernails on chalkboards" sound, it clearly has a biological impact. The USS Shoup noise was more like the fingernails and less like Beethoven.

Fourthly, the opinion expressed in the report indicates that there were no "long term biological effects" due to "masking" because it only occurred over a short duration of three hours. This statement seems to assume the rationalist position that the Orcas are merely communication devices with sound instrumentation designed for a specific long term biological purpose.

This rationalist position is predicated on the opinion that human beings alone have a monopoly on thought, emotions, and the ability to consider their predicament. It ignores the fact that Orcas are a bit more complicated than just biological devices. I don't believe that even the most hardened whale biologist would argue that these animals don't think or feel, so this "negligible" effect of masking statement does not persuade me that the USS Shoup incident was not a real problem.

Unfortunately it appears that the NMFS believes that this "scientifically substantiated" document has absolved the US Navy of any wrongdoing. I will not hold the Navy up to the NMFS standards on this incident, and will continue to maintain that this disaster was another case demonstrating that the US Navy active sonar technologies, and the NMFS standards, need to be seriously reviewed.

Sincerely,


Michael Stocker
Science Advisor
www.sealflow.org

¹ Assessment of Acoustic Exposures on Marine Mammals in Conjunction with USS Shoup Active Sonar Transmissions in the Eastern Strait of Juan de Fuca and Haro Strait, Washington 5 May 2003 National Marine Fisheries Service, Office of Protected Resources January 21, 2005

² See: Mardi C. Hastings "Noise exposure metrics for auditory and non-auditory damage in aquatic animals" J. Acoust. Soc. Am. 116, 2533 (2004)

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Appendix D

Comment Table, Organized by Subject Matter

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**Scoping Comments: NMFS Marine Mammal Acoustic EIS
April 7, 2005**

| Comment | General Public | Non-profit | Industry | State | Federal | Scientist/Academic Institution |
|--|----------------|------------|----------|-------|---------|--------------------------------|
| Scoping | | | | | | |
| Given increased military testing and minerals management activity in the Gulf of Mexico, can you tell me why NOAA didn't schedule a scoping meeting on this coast? | 1-1 | | | | | |
| The AEWG requests that a scoping meeting be held in Alaska. | | | 40-4 | | | |
| Why were no scoping meetings in/around NYC? | 14-1 | | | | | |
| Short notice was provided for the scoping meeting. The Federal Register Notice is dated January 11, with the first meeting January 18. | | 16-2 | | | | |
| WDCS was unable to attend the public consultation meetings due to the lack of notice given. | | 29-1 | | | | |
| The Federal Register Notice did not provide enough information for comment on the scoping process. The Federal Register Notice discussed a process, but it did not discuss any details of expected outcomes and how those outcomes would be applied. | | 16-3 | | | | |
| I would like to submit comments regarding the upcoming acoustic EIS. However, I first wanted to write and request a second attempt at a public comment session originally scheduled for Boston at the New England Aquarium on Tuesday, January 25, 2005. You may be aware that a blizzard struck the area Sunday into Monday (Jan. 22-23), leaving record snowfalls throughout the state. Traveling throughout that week was extremely tough--schools were closed for the entire week and non-emergency personnel were advised not to drive earlier in the week. Due to the impact of weather or driving/parking conditions in Boston, I've been informed that only seven people attended the public comment session as originally scheduled and held. This can hardly count as an effective public comment session, and I hope that you will be scheduling another in the area, as I think this is a topic of serious interest by the public. | | | | | | 21-1 |
| Why is the issue of changing the noise criteria being raised now, when the Acoustic Committee is still in the process of deliberating exactly what the ways intense sounds affect marine mammals. Unlike the Noise Group, the Acoustic Committee is a broad based group of stakeholders brought together by Congress to do this job. | | 30-11 | | | | |
| At the scoping hearings, NMFS failed to clarify the nature of the agency action, indicating that it was undetermined at the present time whether the sound exposure criteria would serve strictly as guidelines or if the new criteria would ultimately become a regulation. | | | 32-10 | | | |

**Scoping Comments: NMFS Marine Mammal Acoustic EIS
April 7, 2005**

| Comment | General Public | Non-profit | Industry | State | Federal | Scientist/Academic Institution |
|--|-----------------------|-------------------|-----------------|--------------|----------------|---------------------------------------|
| <p>We are concerned with the broad scope of this EIS. NMFS has indicated the areas of interest for evaluation of environmental and socioeconomic effects on marine mammals will include U.S. and international waters. We question whether NOAA Fisheries has the resource capability to extend the scope of this EIS so broadly. Thus, we recommend that the scope of this EIS be limited to the federal waters of the Outer Continental Shelf (OCS). Finally, we seek clarification that the geographic applicability of the acoustic guidelines would not extend beyond federal waters of the OCS.</p> | | | 34-7 | | | |
| <p>NMFS's schedule of proposed scoping on the application of new criteria in guidelines to determine what constitutes a "take" of a marine mammal under the MMPA does not currently include plans to hold public meetings in Alaska or Gulf of Mexico States. However, the issue of the impacts of noise on marine mammals is a very important issue to stakeholders in those areas. Stakeholder interest is high in the Gulf of Mexico area because of the level of natural gas and oil exploration, development, and production and in Alaska, in part, but not exclusively, because of potential impacts on the availability of marine mammals for take by subsistence hunters. We recommend that NMFS hold public scoping meetings in these areas, including meetings in Barrow, Anchorage and other areas of Alaska where subsistence users may be affected as well as in the Gulf of Mexico. In Alaska these meetings could possibly combined with visits for Government to Government meetings.</p> | | | | | 35-1 | |
| <p>NMFS proposes that the scope of the EIS address the MMPA and ESA as well as species under NMFS and FWS jurisdiction. However, it does not appear that NMFS has included or intends to directly include FWS in the NEPA analysis or in developing the guidelines. FWS with responsibility for implementing ESA and MMPA should be an active partner in this process, for example, as a cooperating agency on the EIS.</p> | | | | | 35-2 | |
| <p>The scoping period should be extended until the MMC publishes their report on anthropogenic noise.</p> | | 39-1 | | | | |
| <p>I look forward to providing more substantive comments after having had an opportunity to review the MMC report. I hope the comment period will be extended to afford the public the benefit of that opportunity.</p> | | 39-4 | | | | |
| <p>We will provide complete comments on these areas in the coming days. We understand that the agency has indicated a deadline of March 14 for comments on the Notice of Intent, and would encourage the agency to continue to accept comments, specifically with regard to obligations of</p> | 42-12 | | | | | |

**Scoping Comments: NMFS Marine Mammal Acoustic EIS
April 7, 2005**

| Comment | General Public | Non-profit | Industry | State | Federal | Scientist/Academic Institution |
|---|-----------------------|-------------------|-----------------|--------------|----------------|---------------------------------------|
| public participation in the scoping process. While the agency has identified four public meetings to coincide with the scoping process, we believe that these four occasions are not sufficient given the complexity of the NOI and the broad impact of the changes proposed by the agency. We recommend more specific information be presented to the public and more opportunities to comment be provided as the EIS process moves forward. | | | | | | |
| The IWC encourages further research regarding the impacts of noise on marine mammals. However, the scoping document presented here makes many assumptions regarding research that does not yet exist or is in its infancy, and thus requires that a precautionary approach be continued before applying these assumptions to the real-world. | | 44-9 | | | | |
| The EIS must clearly state what uses and user groups will be subject to the proposed guidelines, and what users and user groups will be exempt. | | | | 45-2 | | |
| Alternatives (general) | | | | | | |
| I do not think the alleged "science" is accurate to define these "levels" on page 3 of 8 at this time. Thinking any animal can still live unimpaired after the horrors human profiteers throw at them is extremely unlikely. | 14-3 | | | | | |
| <p>It is time to ban harmful noise totally. I oppose the whole project in this proposal. This issue could be settled by simply banning all noise. The status quo is no noise and we should stay at that status.</p> <p>the past six years has seen much destruction of marine life from this level's use on page 5 of 8. I want a higher standard for marine animal health. What is being allowed now kills and injures. Alternative II is when death/injury occur - that is scary. All of the alternatives mentioned have issues. I do not want temporary injury allowed either since it can result in permanent death.</p> <p>comment on page 6 of 8 - the noise exposure criteria is not accurate enough at all noise kills through hemorrhaging of the brain/ear canal.</p> | 14-5 | | | | | |
| Which alternative proposed for scoping is the preferred alternative? | | 16-6 | | | | |
| The text (70 FR 1873) for Alternative III states: "defining a Level A harassment take as that exposure which results in a temporary shift in hearing sensitivity (TTS) and a Level B harassment take as that exposure estimated to result in a 50 percent behavioral avoidance for each species or group of species." | | | | | 35-12 | |

**Scoping Comments: NMFS Marine Mammal Acoustic EIS
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| Comment | General Public | Non-profit | Industry | State | Federal | Scientist/Academic Institution |
|---|-----------------------|-------------------|-----------------|--------------|----------------|---------------------------------------|
| <p>As written, it is unclear what the 50 percent behavioral avoidance means, and thus, the criterion is unclear. It is also unclear what the ramifications of these criteria might be if NMFS implements them. We recommend you address in the DEIS the following questions regarding how the criterion for Level B harassment in Alternative III will be evaluated and implemented:</p> <p>Does this mean there is a “take” if: 50 percent of the time an individual of this species hears it, it is likely to avoid the sound? Does this imply that, on average, 50 percent of the individuals in the population that are exposed to the sound will avoid it? How will NMFS calculate 50 percent behavioral avoidance? Will separate 50 percent avoidance levels be estimated for different segments of a population if the best available information indicates behavioral avoidance is more or less likely in some segments (e.g., females with calves) than other segments (e.g., adult or juvenile males)? Will separate avoidance levels be estimated for some behavioral categories of whales (e.g., migrating versus feeding) if available data indicate that the likelihood of an individual exhibiting avoidance after exposure to a sound is more likely when the species is engaged in one behavior than another? Will long term avoidance and temporary avoidance be treated the same? Under this alternative, would it be considered a Level B harassment if it was predicted that the sound would cause, on average due to individual responses, 15 percent of the population to avoid an area?</p> | | | | | | |
| <p>An additional alternative should be considered that defines a Level B harassment take as that exposure estimated to result in behavioral avoidance by a lower percentage than 50%.</p> | | | | | 35-14 | |
| <p>All alternatives should include a clause to allow for the development of best available science to be considered.</p> | | | | | 36-15 | |
| <p>The EIS must include, for each alternative, an analysis of how implementation of the proposed criteria would affect federal protections for the bowhead whale subsistence hunt. Any changes to NMFS’s noise criteria that would make the incidental take standards applied during the bowhead whale migration less conservative is beyond the scope of NMFS’s statutory authority. (see comment letter for further clarification)</p> | | | 40-1 | | | |
| <p>My comments today are in support of the National Marine Fisheries Service (NMFS) reducing noise levels underwater received by marine mammals to 120 dB in pulses, or 100 dB in continuous noise or pulses, for the reasons outlined below. This is in keeping with the proposed NMFS noise</p> | 16-1 | | | | | |

**Scoping Comments: NMFS Marine Mammal Acoustic EIS
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| Comment | General Public | Non-profit | Industry | State | Federal | Scientist/Academic Institution |
|---|-----------------------|-------------------|-----------------|--------------|----------------|---------------------------------------|
| criteria Alternative II, although with important differences. | | | | | | |
| Stating that Level B harassment occurs when there is 50% behavioral avoidance is unclear. Does this mean that 50% of all extant members of a species must show avoidance? Or 50% of stock, as stocks are defined by NMFS or the IWC? 50% of a pod, a haul out, or some other size group? Or just a 50% probability of a reaction by an individual? The 50% standard is not very conservative. In practice, it means that noise emitters will do the statistics and use the sound level at which 49% of the target population is estimated to have an avoidance reaction. How was it decided that the percentile to use for behavioral avoidance is the 50 th percentile? No rationale was given. | | | | | | 25-12 |
| The 50% standard is also not very conservative. In practice, it means that noise emitters will do the statistics and use the sound level at which 49% of the target population is estimated to have an avoidance reaction. Essentially half of the population can be disturbed -- perhaps driven away from an important food source or nursery area -- and it doesn't, under this standard, even register as behavioral disturbance. | | | | | | 25-13 |
| How was it decided that the percentile to use for behavioral avoidance is the 50th percentile? Perhaps by analogy to LDS-50 measurements of responses to toxic substances? But LDS-50 values are typically used only as a starting point, with actual exposure levels being set at a small fraction of the LDS-50 value. That was not done here, and indeed no rationale for the 50% level is given. | | | | | | 25-14 |
| From the proposed alternatives, one could easily conclude that, according to NMFS and the experts on its panel, such strandings never happened. At least, I see no evidence of this alarming phenomenon being incorporated, in a precautionary way, into these proposed alternatives. If one is to engage in the very risky process of extrapolations, why not start with the known lethal reaction of beaked whales to moderate received levels of mid-frequency sonar and extrapolate this degree of sensitivity to all other marine mammals? I see no scientifically defensible reason why extrapolations only seem to be employed in a less conservative direction. Considering how little we know of the lives of whales, I find the use of extrapolations in this Notice of Intent highly inappropriate and premature. If, in the very infancy of studying diving behavior in marine mammals, we would have extrapolated from human diving behavior, a picture highly aberrant from reality would have emerged. | | | | | | 28-2 |
| While the duration of exposure is an important factor in determining the level of impact, I am not convinced that the manner in which duration is handled by some of the | | | | | | 28-8 |

**Scoping Comments: NMFS Marine Mammal Acoustic EIS
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| Comment | General Public | Non-profit | Industry | State | Federal | Scientist/Academic Institution |
|---|-----------------------|-------------------|-----------------|--------------|----------------|---------------------------------------|
| <p>Alternatives is sufficiently conservative. Once again, there is almost no hard data upon which to base management. Are cetaceans more affected by a quieter noise over a longer period of time vs. a louder sound with a shorter duration? We are unable to say.</p> | | | | | | |
| <p>In place of these Alternatives, it would be appropriate to consider the wider management options should ensure effective protection of vulnerable species, those in areas of critical habitat, such as feeding, breeding and nursing grounds, as well as protection of mother and calf pairs.</p> | | 29-14 | | | | |
| <p>In reviewing the Notice we are struck by how far the process has become compromised by deference to the very industries that NMFS is supposed to be regulating. The agenda revealed in the document shows the Agency's desire to raise the allowable level of sound so high as to avoid the inconvenience of restricting industries that use devices that inject massive amounts of intense sound into the oceans, namely the military, the oil and gas exploration industry, and the scientific establishment. Only one of the Alternatives listed, Alternative II, which we support, even considers the actual protection of marine mammals from a precautionary standpoint. The other Alternatives range from bad (180dB, Alternative I), to worse, worse still, appalling and downright atrocious.</p> | | 30-2 | | | | |
| <p>The focus of the proposed EIS has been bizarrely attenuated, apparently in an attempt to ignore the plethora of data showing that anthropogenic noise does indeed harm living systems. The restriction of discussion to that related to Permanent Threshold Shift (PTS) and Temporary Threshold Shift (TTS) is blithely justified in the Notice by "providing a more scientific basis for defining the threshold levels." For over five years now and throughout the intensely controversial EIS process for Low Frequency Active sonar, representatives of the Office of Navy Research and the NMFS have been decoying administrative and public attention by focusing almost exclusively on PTS and TTS. This orientation argues that the only effects of sound we have to be concerned with are those that cause physical damage to the ears of marine mammals. Real world events have not cooperated in supporting this particular argument and almost all of the new information about these events that has come to light, mainly through the Acoustic Committee, has been scrupulously ignored. Why? Ignored is the elaborate modeling done by Dr. John Hildebrand, Dr. Peter Tyack and Dr. Bob Gisiner concerning the Bahamas 2000 strandings and presented at the San Francisco meeting of the Committee on July 27, 2004. Combining the likely routes and intensities of active sonar devices moving</p> | | 30-7 | | | | |

**Scoping Comments: NMFS Marine Mammal Acoustic EIS
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| <p>through the area, and the likely movements of whales, they gave 138dB as the median level of sound that struck the whales who stranded and died. We have learned that in some stranding incidents coincident with noise events, such as in the Azores (2002) and the Canaries (2002), whales have died with bubbles in their lungs and organs. It now appears from a series of studies and workshop presentations that there exists a mechanism of death quite different than that requiring levels of sound loud enough to physically injure hearing organs. It is the ability of sound to panic whales who, upon perceiving the onset of a sound louder than ambient, rise quickly to the surface from a deep dive and die from bubbles being created in their blood; a condition similar to the “bends”. Thus we see a behavioral response that at relatively low levels of anthropogenic sound can lead to death. This phenomenon does not appear to be restricted to beaked whales as had been previously thought, for now there are indications that sperm whales may also suffer from this condition given the right circumstances. The formulation of this EIS ignores all of this, or so we can infer from the list of Alternatives proposed in the Notice. The EIS process is not being adhered to as the law mandates. It is not prefaced with a “full and fair” discussion for the process but is constrained to just those aspects of the discussions which have elements that can argue for higher levels of sound to be allowed. In fact, just about the entire logic of the PTS and TTS criteria is based on highly abusive studies by the Naval Ocean Systems Center, San Diego that involved the deliberate infliction of intense levels of sound on captive dolphins and belugas. The paucity of sample size and the irrelevance of the study provide neither informed science nor guidance for setting criteria. It would be impossible to measure a startle response at far lower levels of sound with this type of experiment.</p> | | | | | | |
| <p>There are limits to how far data can be extrapolated. Over and over, from the Low Frequency Sound and Marine Mammals Committee in 1994, through the HESS panel, and up to the current deliberations of the Acoustic Committee, the paucity of data from which critical decisions are being made has to be decried. It appears from the Notice that the NMFS, while acknowledging the extreme lack of available data, has decided to proceed anyway, and to extrapolate from that inadequate data to all creatures in question, including using data from experiments on terrestrial animals to fill in the gaps.</p> | | 30-9 | | | | |
| <p>The credibility issue with this EIS process may begin with the belief that outside pressures are forcing a premature</p> | | 31-3 | | | | |

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| <p>product. Will it be of value to make an extra effort for transparency and disclosure? Most of all, will the process reflect clear protocols for precautionary principles? For example, Alternatives above II would more than double allowable noise. This does not seem to be a defensible precautionary approach in the face of ignorance. We have learned that the Criteria values for A and B in the different Alternatives are not locked in place, but may be mixed and matched as the DEIS develops. Unfortunately, we suspect from all that we have learned that Alternative V is heavily favored even at this early stage. Overall the matrix is not off to a good start in terms of credibility.</p> | | | | | | |
| <p>The emphasis in the scoping process to date is for regulatory thresholds based on TTS and PTS onset, almost as a premature conclusion. However, it is logical to assume that initial acoustical impacts will be behavioral, that many animals will modify their biologically significant behavior if subjected to a noise lower than that which would induce TTS. The public announcement describing the EIS process asserts that “guidelines (will be based) on exposure characteristics that are derived from empirical data and are tailored to particular species groups and sound types.” But anyone with a clear view of current knowledge will have difficulty with the assertion that guidelines will be “derived from empirical data”. There simply is not enough empirical data to go on. For example, a handful of audiograms are available for perhaps 10 species of odontocetes and 11 species of pinnipeds, most from non-representative prime-age captive animals. Only 20% of the 119 marine mammal species, and no baleen whales at all. Where multiple studies of one species exist the data points reflect natural variations, not one size fits all as implied in the resulting matrix. The limited data set of audiograms is interpreted in the matrix as if marine mammals did not have individual variability, from age, disease, injury, and other reasons.</p> | | 31-6 | | | | |
| <p>Beaked whales appear to be omitted from the publicly available matrix, but we understand that the matrix may have some sort of accessory category for beaked whales, and look forward to seeing the specifics. The DEIS must declare that significant harm may come to beaked whales from human noise, even if none are found dead or dying near an event. Only one percent of the beaked whales in an environment will be detected by the best experts, and they may be everywhere specific environmental conditions exist; a very sizable portion of the ocean. Mitigating harm to beaked whales should be a focus of the matrix.</p> <p>Beaked whales have demonstrated their behavioral</p> | | 31-20 | | | | |

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| <p>responses to low levels of specific sounds by altering their surfacing behavior, which put some of them at risk of grievous injury and death. Specific sounds from naval operations and seismic exploration activities appear to be the cues, and sophisticated modeling of the 2000 Bahamas event by Balcomb and Hildebrand suggested a mean level of exposure to noise in the range of 130-140 dB. The few mass stranded beaked whales properly studied have offered conclusive proof that many died of physiological effects brought on by behavioral responses that unintentionally placed them at risk. A paper summarizing beaked whale mass strandings and some concurrent naval operations will be given at the 2005 European Cetacean Society (ECS) meeting, and the findings are startling and significant. Suction-cup tagging has been proven for beaked whales. Why not tag beaked whales in an area where a significant noise event will take place? That concept was used successfully for sperm whales during seismic surveys. How many beaked whales have been lost at sea or survived crippled since the vast majority of mass strandings began in the early 60's is unknown, but the link has been proven, something should be done about it, and this DEIS is the place to start.</p> | | | | | | |
| <p>Several of the alternatives presented are, in our judgment, untenable as management options and should not be pursued.</p> | | | 32-5 | | | |
| <p>NMMA appreciates the Agency outlining its proposed alternatives, although we reiterate our earlier claim that sound exposure criteria for each alternative should be specifically outlined for each class of mammals in order for the public to fully understand the potential impacts of the proposed agency action. With respect to the proposed alternatives, NMMA currently prefers to No Action Alternative due to an inability to assess the Action Alternatives in any meaningful way at this time.</p> | | | 32-20 | | | |
| <p>NMFS intends to prepare an EIS to assess the potential impacts of the proposed framework for developing and implementing science-based acoustic "take" criteria. The notice sets forth six alternative frameworks for determining the acoustic threshold level at which both Level A and Level 6 harassment "Yakes" might occur. Industry would be better able to comment on the alternatives if the noise exposure criteria were already published. However, as a general matter, industry does not believe that the best available science supports Alternatives I and II.</p> | | | 34-2 | | | |
| <p>At high intensities/close range, frequency is likely not a primary factor in physiological damage; thus I support the approach you are taking to divide sound sources only by</p> | | | | | | 33-3 |

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| pulsed/non-pulsed and single/series. As currently framed, Alternatives 3-6 do not seem to account for long-range masking (where frequency would make a difference), so the frequency-independent classes of sound are valid. | | | | | | |
| Industry believes that the sound associated with its offshore operations should be regulated at a level where there is no injury (permanent threshold shift or PTS) or "biologically significant" impacts, i.e., impacts on the survival and reproduction of marine mammals. Further, consideration of sound thresholds should consider biological impacts at a population level. Finally, establishment of sound threshold levels should have a scientific basis and reflect species differences. | | | 34-5 | | | |
| The reference to "status quo" when no single "status quo" criteria seems to exist is a concern. | | | | | 36-2 | |
| Not clearly allowing for the use of "best available science" to supplement or replace any of the proposed alternatives is a concern. | | | | | 36-3 | |
| The analysis of alternatives must be objective, unbiased and searching. In addition to the "no project" alternative (which, in this case, would maintain the current criteria for acoustic takes of marine mammals), the EIS should consider a variety of criteria that would provide different levels of protection to marine mammals from noise-producing activities in the oceans. Because the chosen criteria will be used to determine when Level A and Level B harassment occurs under the MMPA, all alternatives must, at a minimum, satisfy that statute's definitions of such harassment. See 16 U.S.C. § 1362(18). In this respect, several of the alternatives proposed by NMFS are inadequate and, importantly, would be unlawful if adopted and used to define Level A and Level B takes under the MMPA. | | 38-5 | | | | |
| The representation of a 'status quo' for criteria and thresholds for impact of sound is seriously in error, and biases the NOI severely. We see the only remedy that would be fair and consistent with precedent and existing 'science' would be to retract the NOI and state that the 'status quo' was incorrect as given. There are a number of other reasons to retract (or at least amend) the NOI. | 41-1 | | | | | |
| <p>Rather than contest each statement of the NOI at this time, we focus on a few key issues. Perhaps the single most serious issue is the definition of the 'status quo' (see Table 1 on page 1873) and its position as the 'no action' alternative.</p> <p>We have studied MMPA permits granted by NMFS and concluded that NMFS has not in fact used the 'status quo' over the past six years as guideline for impact. Because the</p> | 41-21 | | | | | |

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| <p>stated ‘status quo’ impact thresholds were not recommended by a NMFS 1997 or 1998 Panel (as stated at the Seattle scoping meeting) and because the thresholds have not at all been applied to compliance actions reviewed by NMFS over the past six years, we respectfully request that NMFS retract the NOI.</p> <p>If the stated thresholds were indeed the ‘status quo,’ then there would be very few man-made sound sources that could operate in the world’s oceans without a permit. Surface ships, fish finders, fathometers, very small explosives, in-water machinery, side-scan sonar, sub-bottom profilers, recreational vehicles, navigation sonars, oceanographic probes, etc. would all have to apply for permits for numerous MMPA and ESA ‘takes.’ Ambient noise levels in many ocean areas (e.g., much of the Western Mediterranean Sea) are above the ‘status quo’ threshold.</p> <p>According to statements by NMFS at the Seattle Scoping Meeting of 20 January 2005, the ‘status quo’ thresholds are the result of NMFS Panel recommendations in 1997. We have not seen any outputs from this panel (unless it is the HESS committee, which addressed only high-energy seismic-survey sources). We believe that NMFS was referring to the NOAA/NMFS ‘Criteria’ meetings of 1998. We attended these meetings and have detailed notes. Nowhere do we find any indication that the Panel recommended anything resembling the ‘status quo.’ In fact, the results of the Ridgway et al. and Kastak-Schusterman, et al TTS tests were major topics of the meeting. Dr Gentry supported a proposed set of impact thresholds based on the TTS tests (developed by Dr Bob Gisiner of ONR and promulgated by Dr Jim Miller of URI). Dr. Gentry then briefed the proposed thresholds at other public meetings (e.g., MMS-ITM in New Orleans in December 1998). These thresholds were not at all related to the ‘status quo’ numbers.</p> <p>That NMFS has consistently applied the ‘status quo’ standards to compliance actions over the past six years (as stated by NMFS at the Seattle Scoping Meeting) is simply not true. In fact, we are hard-pressed to find a single example of a NMFS-reviewed compliance document that uses the ‘status quo’ thresholds (other than HESS airgun survey thresholds, and then only partially).</p> <p>Instead, we find a number of Final Rules and Section 7 Consultation statements that set much different thresholds</p> | | | | | | |

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| <p>as precedents. Examples include: CHURCHILL Ship Shock, SURTASS-LFA, NPAL, Point Mugu EIS, SABRE-DET (Air Force), many permits for seismic surveys, many permits for impact of aircraft noise on animals in water and in air, pile driver actions, small explosive actions, etc. NONE used the 'status quo' thresholds (except perhaps, but only in part, the airgun-survey permits). A list of references and notes on each of the cited compliance documents can be made available, but all of these have passed through NMFS.</p> <p>Further, to say that impact thresholds used in compliance documents (and approved or reviewed by NMFS) over the past six years are 'generic' and not based on the latest 'science' is just plain wrong. Examples listed above used essentially the same 'science' as is available today. After all, what is new? Certainly nothing for explosives or LFA or NPAL or HF sonars. TTS data for mid-frequency sonars add little to what was available in 1998 (as discussed at the NMFS Criteria Meeting slides of April 2004).</p> | | | | | | |
| <p>How will the evidence and resultant data obtained after studying these stranding events be assimilated and used in determining the criteria and the potential impacts of each proposed alternative?</p> | 46-1 | | | | | |
| <p>NMFS should consider Potential Biological Removal (PBR) as one of the alternatives in the Agency's EIS scoping and review of acoustic criteria.</p> | | 47-6 | | | | |
| <p>Based on the relevant Federal Register notices and public hearings, PBR is not an option being considered by NMFS as an alternative. Why not?</p> | | 47-16 | | | | |
| <p>Alternative I</p> | | | | | | |
| <p>Alternative I (no action) can be improved upon; however this approach cannot be discounted if the data are not sufficient to set in place an alternative model.</p> | | 29-10 | | | | |
| <p>This alternative is supported until and unless additional research on marine mammals and noise is conducted.</p> | | | 32-21 | | | |
| <p>Alternative I would perpetuate the use of the existing thresholds for Level A and Level B harassment. We refer NOAA Fisheries to comments industry previously submitted for detailed discussions of this point.'</p> | | | 34-3 | | | |
| <p>Alternative I adopts the status quo (or no action alternative), which we assume to be using 160 dB for level B and 180 dB for level A. This is not a realistic alternative because the best available science developed since the late 1990's would be ignored. Both the MMPA and the ESA require using the best available scientific and commercial data available.</p> | | | | | 35-9 | |
| <p>We recommend that, prior to the drafting of the EIS, NMFS evaluate whether additional alternatives might be necessary to ensure that this proposed action does not have unintended</p> | | | | | 35-16 | |

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| consequences on the requirement of the act referred to above related to the availability of marine mammals for take for subsistence activities. We recommend that, in this evaluation, NMFS solicit input from potentially affected groups in Alaska. | | | | | | |
| Describing the Alternative I (No Action Alternative) 180/160 dB re 1 μ Pa SPL impact thresholds as “current Level A and B harassment thresholds” or the “status quo” is misleading. Navy experience is that it appears that different criteria have been used in different circumstances. Recent scientific studies have shown that energy flux density as a more appropriate metric for sonar effects analysis. Limiting the criteria to the “status quo”, in light of recent scientific developments, is inappropriate based upon NOAA’s prior application of differing criteria. | | | | | 36-1 | |
| Alternative I is insufficiently protective. Lower levels of noise can cause Level B behavior changes. The 180 dB criterion is based on extrapolation from terrestrial species, and the validity of the extrapolation is unknown. | | | | | | 43-11 |
| Alternative II | | | | | | |
| Alternative II is described as “very conservative”, but appears that it fulfills the terms of the MMPA: “takes would occur at the SPL at which the most sensitive species first begin to show a behavioral response.” This sounds very much like the MMPA for non-academic and non-military uses, for which a take is defined as “disruption of natural behavioral patterns, including, but not limited to migration, surfacing, nursing, breeding, feeding, or sheltering.” What justification is there for relaxing the language of the MMPA, as is done in the other alternatives? | | | | | | 25-4 |
| I support Alternative II, which I understand is the most conservative option. I find it nothing short of remarkable that of the six options, only one is more conservative than the status quo, namely Alternative II. This, despite all the new scientific evidence indicating that we have grievously underestimated the impact of at least some types of underwater noise on at least some groups of marine mammals. Despite all the grandiose talk of employing “science-based” acoustic criteria supported by “empirical data”, there is not a single scientific expert (myself included) that, to my knowledge, predicted that beaked whales would react to mid-frequency sonar (and perhaps seismic) by hemorrhaging throughout their bodies and washing up dead on beaches. I guess the extrapolations from chinchillas and humans didn’t quite cover that scenario. Yet that is precisely what happened and continues to happen while scientists tinker with their noise exposure formulae. | | | | | | 28-1 |

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| Alternative II appears to be precautionary, but we have concerns about how it will monitor and enforced. | | 29-11 | | | | |
| Takes “would occur at the SPL at which the most sensitive species first begin to show a behavioral response”, with Level A harassment when a human source “exceeded the highest average ambient noise level in the area of operation”. Activity may be permitted that simply adds loud noise to an already high ambient level. Where is the breaking point for the animals involved? How will Level B harassment, when “noise from a human source exceeded the lowest possible ambient noise condition”, be measured/enforced? | | 31-14 | | | | |
| There appears to be a significant gap between Alternatives II and III. Alternative III’s Level A jumps to TTS onset, an extremely extrapolated value that cannot be accepted as anything but a crude estimate for most affected animals. Logically, there should be some intermediate value, a value that CSI believes should be based on behavior. | | 31-15 | | | | |
| NMMA strongly opposes Alternative II, which would establish a basis for unreasonable restrictions on recreational boating and angling access even in instances when such restrictions would do nothing to protect the targeted species. The selection of ambient conditions to use for these criteria is problematic. Ambient noise extremes can exceed 260 dB re 1 meter from lightning strikes or increase 35 dB with continuous driving rain, both of which can cause TTS. Such extreme variability based on natural environmental conditions begs the question, absurd though it may be: do we regulate the weather? NMMA sees no basis for a criterion based on human noise sources exceeding the highest average ambient noise level in the area of operation, since such a standard seems to relate neither to a mammal’s auditory threshold or the likelihood of biologically significant disturbance, nor does it account for natural, radical fluctuations in ambient noise levels, which clearly demonstrate an individual’s ability to cope with variation in noise levels. Even more concerning to NMMA is the classification of a human noise source exceeding the lowest possible ambient noise conditions as a Level B harassment. This standard would functionally restrict all human activity in the marine environment, which is clearly not the intent of the law and which would do nothing, in our view, to advance marine resource protection in an equitable way. In addition, we believe this alternative fundamentally conflicts with the multiple use mandates of the National Environmental Policy Act. Alternative II also entails a high degree of unpredictability. The regulated community would be unable to determine whether or not it | | | 32-22 | | | |

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| <p>was in fact disturbing a marine mammal because of the high degree of variability in ambient noise levels, as well as the fact that such a standard has the potential of being radically different depending on the specific marine environment, even if the marine mammal species for which the protection is targeted is the same. The result could be a relatively high threshold for disturbance of a mammal in one marine environment, and, in a different environment, an extremely low threshold for disturbance for the same mammal type. This poses significant challenges to both our ability to determine the impact of these criteria as well as cope with any regulations which may emerge from their eventual application.</p> | | | | | | |
| <p>While the dominant approach implied by the Notice of Intent relies on determining physiological, auditory impairment across a complex array of species and sound types, your Alternative 2 shines as a (potential) beacon of common sense and clarity. By turning regulatory attention to the current ambient noise conditions, and setting harassment standards based on the idea of not radically changing current conditions, you point the way toward a much simpler and more biologically and scientifically sound approach. The prime advantage of this approach is that it addresses what may be the most biologically important effect of human noise in the sea: masking of acoustic signals important for communication, navigation, or prey detection. The central benefit of this approach is that it starts by considering the existing acoustic profile of the ocean environment, and works to be sure that additional anthropogenic noise does not markedly change the ambient state that exists. It operates from an assumption that the overall acoustic profile of each habitat is an important aspect of the environment, to which the resident and transient species are adapted and accustomed. This seems to be a far more precautionary, and common-sense, foundation for regulation than the other proposed Alternatives, which ignore the overall acoustic health of the environment and focus instead on identifying the limits of tolerance of individual species.</p> <p>However, as currently framed, Alternative 2 seems to be written in such a way as to be little more than an extremist straw man, easy to discount as unrealistic. As you move forward into the DEIS phase of the project, it's crucially important that this "low end" Alternative be re-structured so as to be worthy of true consideration.</p> <p>As currently written, just the motor noise of a research or</p> | | | | | | 33-10 |

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| <p>industry vessel would, in most locations, trigger Level 2 harassment standards (louder than the lowest possible ambient noise level). Likewise, virtually any extreme noise source would trigger Level A harassment (louder than the highest average ambient noise level). While this may indeed be a virtuous standard (and one that would likely find widespread public support), it's hardly a reasonable or practical approach, given the current operating standards of most noise-making human activities at sea.</p> <p>At a minimum, Alternative 2 should be revised to suggest a range of sound intensity above ambient conditions that would be allowable, and a distance at which this threshold would be measured (such distance should increase in relation to propagation models: a greater distance for low frequency noises than for mid or high-frequency). One logical value for such an approach might be the Critical Ratio for the species most sensitive to masking in the area being considered. Thus, for intermittent noise, we might expect that the species could reliably carry on communication or sound perception during the intervals between the pulses, and that even with continuous or series of pulsed noises, it could adapt to the slightly increased ambient conditions created by the introduced noise source. That is, the standard would be based on a range that the animal is known to be able to adapt within.</p> | | | | | | |
| <p>Despite the virtues of the ambient-noise basis of Alternative 2, implementation would be difficult due to the apparent requirement to know the existing ambient noise levels in the location of the activity to be regulated. A practical alternative would be to develop criteria based on a combination of habitat classification and current uses by humans. (Michael Stocker has developed this idea more fully in recent papers presented at 2004 conferences of the Acoustical Society of America and International Wildlife Law).</p> <p>The human-world analogue to this approach is the standard Noise Criteria (NC) curves used to set acceptable noise levels in various locations, from libraries to offices and industrial facilities. The uses of the space, the numbers of people using it, and the types of communication and activity taking place in each type of location are factors used to set the acceptable noise levels.</p> <p>As applied in the sea, this approach would establish protocols that consider the existing acoustic profiles of a variety of habitats or use zones, along with the biological</p> | | | | | | 33-15 |

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| <p>robustness/sensitivity of the populations. Possible classifications, each of which has unique acoustic properties, could include:</p> <ul style="list-style-type: none"> Harbors/shipping lanes Oil development areas Coastal reefs, kelp forests Coastal estuaries (including related offshore areas) Coastal offshore waters Outer continental shelf Deep ocean Productive fishing grounds <p>Each zone has a characteristic acoustic profile. Terrestrial bioacousticians, and the US National Park Service, have begun to use the complete acoustic profile of specific habitats as a measure of ecosystem health (see Krause and Gage (2003), Testing Biophony as an Indicator of Habitat Fitness and Dynamics, a report for Sequoia National Park, http://envirosonic.cevl.msu.edu/seki/). Related to this is the concept of “acoustic niches” (see Krause (1987), The Niche Hypothesis, http://www.wildsanctuary.com/niche.pdf): animals co-evolve to share the acoustic space, each species occupying distinct “acoustic niches” classified by frequency distribution and diurnal and/or seasonal patterns, thus allowing all species to hear their kind amidst the cacophony of natural sound. Anthropogenic sounds in the sea clutter the acoustic space, disrupting or masking biologically important sounds; in addition, most of the introduced human sounds likely to be subject to these Criteria operate around the clock, and have no diurnal “down time.”</p> <p>Ocean Noise Criteria based on this approach would allow for much higher levels of introduced human noise (perhaps 160dB or more, measured at a specified distance) in areas with high ambient noise levels (such as shipping lanes and heavily-industrialized zones such as the Gulf of Mexico), while minimizing introduced noise in biologically rich areas such as waters offshore estuaries, or important fishing grounds.</p> <p>Measurements made in one or several representative locations for each “zone” would be used in permitting activities in similar zones elsewhere.</p> <p>An advantage of this approach is that it might be more able to be formulated so as to consider chronic stress and long term habitat degradation (factors which have not been fully considered in assessment of the recovery and/or reductions</p> | | | | | | |

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| <p>in fish and cetacean stocks).</p> <p>Ideally, this “zoned” approach to setting Ocean Noise Criteria would set standard thresholds of allowable human noise above ambient conditions in each zone, as suggested above (perhaps based on an average, minimum, or maximum Critical Ratio for local species). It is also possible that an arguably arbitrary figure (such as the 6dB and 12dB factors being suggested in the current ONC Alternatives) could be used. However, if there is a strong need or desire to base standards on more species-specific values, then a few notes are in order:</p> <p>Avoidance is not an especially trustworthy measure; audiograms (including Critical Ratios) of known species offer a better start, as it gives us a clearer sense of when an introduced noise is audible, which is when it will begin to compete with biologically important sound cues.</p> <p>As considered in the Notice of Intent and in my first section of comments, the type of noise could/should also be considered: pulsed (occasional or periodic) or continuous, and the waveform factors (rise time or similar analogues) that may suggest whether the sound is likely to be processed/experienced similarly to natural sounds.</p> <p>When considering ambient noise and masking, long-range impacts must be considered. LF sources will potentially increase ambient noise levels far outside the area of activity, and this will need to be included in the regulating of these noises.</p> <p>Biologically rich areas will tend to have higher ambient noise levels, yet also will be more susceptible to impact than areas sparse in life. Some consideration of this may need to be factored in (i.e., perhaps slightly lower levels above ambient would be permitted in biologically rich areas, and somewhat higher levels above ambient in areas where there is little ocean life).</p> | | | | | | |
| <p>Alternative II appears to be a "zero tolerance" option as the thresholds for both Level A and Level B harassment would result in a "take" in every instance. Industry does not agree with Alternative II as it is not possible to implement without eliminating all other sound from anthropogenic ocean activity.</p> | | | 34-4 | | | |
| <p>NMFS characterizes Alternative II as the “precautionary approach” based on “very conservative behavioral response data.” There is no one currently accepted definition of the</p> | | | | | 35-10 | |

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| precautionary approach. Where information is lacking, the ESA and the MMPA promote an approach that is protective of the species and gives benefit of the doubt to the species. The feasibility of alternative 2 is minimal and perhaps not even viable in that it assumes that we know the ambient noise in the “area of operation” which is highly unlikely. | | | | | | |
| Alternative II has no scientific data to support such a recommendation. The idea of basing impact thresholds for animals on the estimated ambient noise level in an area, rather than the animals’ estimated susceptibilities to sound is not scientific. This amounts to saying that if an animal can hear a sound, it is harassed. This is an extreme interpretation of the MMPA and not supported by the NDAA version of the MMPA. The highest average ambient noise level in any given part of the ocean may not be substantially different from the lowest average ambient noise level. | | | | | 36-16 | |
| Alternative II is likely to be over-protective. It would require a permit for virtually any activity that makes noise near a marine mammal, whether the noise causes any behavioral changes or not. While there would be value to NMFS having sufficient information on ambient noise levels to implement this alternative, and any noise above background may affect marine mammals through masking, much of the time natural ambient will be far above the minimum, and at these times anthropogenic noise could have no effect at all. Depending on how the "highest average" is defined, it may or may not have anything to do with the level that causes injury. Nevertheless, this is the only alternative under consideration that would require a permit for all activities that result in takes. | | | | | | 43-12 |
| Regarding the specific alternatives provided in the scoping document, Alternative II is presented as being based on conservative behavioral response data, with Level A harassment occurring if received noise from a human source exceeded the highest average ambient noise level in the area of operation. However, this does not take into account the possibility of shifting baselines for ambient noise. For instance, increased vessel traffic in an area may be the source of ambient noise (depending on whether ambient noise is defined as natural background noise, or ever-present noise), which alone may be loud enough to disturb animals. Additionally, as noise activities occur in an area, these may contribute to ambient noise, thus having a cumulative impact on marine mammals. Therefore, a more defined minimum “ambient noise level” is necessary for Alternative II. | | 44-4 | | | | |
| Alternative III | | | | | | |

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| Comment | General Public | Non-profit | Industry | State | Federal | Scientist/Academic Institution |
|---|-----------------------|-------------------|-----------------|--------------|----------------|---------------------------------------|
| This alternative includes only TTS and PTS in the criteria for Level A harassment. The MMPA defines Level A harassment as “any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild”. Certainly TTS and PTS can count as injury, but indirect effects of noise – such as diversion from a critical feeding ground – can injure and kill marine mammals too. These alternatives are too narrow to fulfill the requirements of the MMPA. | | | | | | 25-2 |
| Avoidance reactions appear to be the only type of reactions covered under Alternative III. Avoidance occurs at high sound levels, but other effects at lower levels are significant too. Other changes in behavior should be given attention, including changes in feeding behavior, effects on mother-child interactions, effects on mating behavior and social interactions, etc. Other effects that avoidance should be considered. | | | | | | 25-11 |
| Alternative III defines Level B harassment as occurring when there is 50% avoidance by a species or animal group. While such behavior would certainly suggest harassment, I can readily imagine scenarios whereby animals are harassed but choose to stay because they have encountered a large patch of prey. There may be negative impacts to staying, but these must be balanced against other needs the animals must fulfill. As such, it is difficult to determine whether a particular, short-term response to noise (such as abandonment or staying) translates into a threat to a population’s health. Incidentally, Table 2 shows Level B harassment under Alternative III to occur at 160 dB for gray whales, based on studies by Malme et al. (1983, 1984). I understood these studies to show 50% avoidance at around 120 dB, not 160 dB, for continuous noise. | | | | | | 28-6 |
| Alternative III is not a conservative approach. It only considers the auditory impacts and so for the reasons stated above, it is not satisfactory at all. | | 29-12 | | | | |
| There appears to be a significant gap between Alternatives II and III. Alternative III’s Level A jumps to TTS onset, an extremely extrapolated value that cannot be accepted as anything but a crude estimate for most affected animals. Logically, there should be some intermediate value, a value that CSI believes should be based on behavior. | | 31-15 | | | | |
| NMMA opposes the use of behavioral avoidance as a standard for determining an acoustic take under the Marine Mammal Protection Act. As has been noted previously, it is unclear whether behavioral avoidance results in biologically significant harm to the animal. The science on avoidance for many marine mammals is equivocal, often with the same individual mammal responding differently to the same noise | | 31-22 | | | | |

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| <p>source (i.e. approaching the source on one occasion, and avoiding it on another). In social groups, even the composition of individuals can lead to differential responses by individuals and the group. Social communities compound the variability in behavior. Moreover, the science which undergirds avoidance is almost completely based on non-repeatable observational studies, about which we have already raised questions. Much of the observational work was conducted without segregating noise from physical presence and some without any meaningful acoustical calibration. NMFS should not pursue criteria based on behavioral avoidance without the benefit of a long-term research study utilizing controlled exposure, dose-response experiments with appropriate acoustical calibration and bathymetric measurements to estimate sound speed profiles, transmission loss, source levels, etc. Studies must have the statistical rigor to demonstrate biologically significant impacts on the mammal population. In addition, avoidance by marine mammals is often a preferable outcome, particularly when such avoidance results in the animal not be struck by a ship or other vessel. NMMA believes that NMFS has failed to provide adequate justification for its 50 percent avoidance standard within its Notice of Intent, and NMMA is not convinced that the body of scientific research on avoidance is sufficient to justify such a criterion. NMMA also opposes the Level A criterion of TTS onset. Temporary threshold shift, while conceivably an indicator of stress on the animal, does not in itself result in irreversible physical harm. Moreover, TTS onset does not necessarily indicate a "disturbance" of a marine mammal. In any event, NMFS should identify the TTS onset occurrence in each of the marine mammal species for which it is pursuing these new guidelines in order for public stakeholders to adequately assess the impact of this criterion.</p> | | | | | | |
| <p>Industry believes that the sound associated with its offshore operations should be regulated at a level where there is no injury (permanent threshold shift or PTS) or "biologically significant" impacts, i.e., impacts on the survival and reproduction of marine mammals. Further, consideration of sound thresholds should consider biological impacts at a population level. Finally, establishment of sound threshold levels should have a scientific basis and reflect species differences.</p> | | | 34-6 | | | |
| <p>Alternatives III through VI must define Level A harassment by taking account of potential non-auditory injuries as well as auditory ones, not based solely on TTS and PTS data, as now proposed. Auditory impacts are not the only, or even more important, form of injury to be suffered by marine</p> | | 38-7 | | | | |

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| mammals from ocean noise pollution; nor, as we have discussed with respect to strandings, do they necessarily occur at lower decibel levels than other forms of injury. | | | | | | |
| Alternative III's definition of Level B harassment, which is now proposed as "that level of noise exposure known or estimated to result in 50 percent behavioral avoidance of a sound source," be amended. Scoping Notice at 1874. As proposed, it appears to account only for animals' avoidance of a sound source, not for any of the other important behavioral reactions that may occur-such as changes in feeding behavior, effects on mother-calf interactions, effects on mating behavior, and other social and energetic effects. In addition, by setting the threshold avoidance level at 50 percent, Alternative III as proposed fails to give effect to the MMPA's precautionary definition of Level B. | | 38-8 | | | | |
| Alternatives III-VI are insufficiently protective. 105 dB is sufficient to cause behavioral changes, and that is far below the 160 dB and above levels envisioned in these alternatives. The criterion for Level A is 155-165 dB to 181-191 dB above threshold for mid-frequency cetaceans. A noise the same number of dB above threshold for a human would be far above the pain threshold. It is extremely difficult to produce a received level above 220 dB more than 10 meters from a source in water, meaning Alternative VI essentially defines Level A harassment as an impossibility. | | | | | | 43-13 |
| Scientific experts knowledgeable in the field of TTS have documented that TTS is not injurious and therefore should not be used as level A criterion. This alternative should be removed from consideration for technical reasons. | | | | | 36-17 | |
| Alternatives III-V contain acoustic criterion primarily focused on temporary threshold shifts (TTS) or permanent threshold shifts. These are both physiological responses of marine mammals to noise, and does not address behavioral responses (with the exception of Level B criterion for Alternative III, which indicates 50% behavioral avoidance). The MMPA defines harassment as "...any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the while [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, feeding, or sheltering [Level B harassment]." Simply indicating when a TTS or PTS occurs in the marine mammal ear does not take into account behavioral changes that may impact migration, breathing, nursing, feeding or sheltering. For instance, one study has found avoidance of sound sources at several | | 44-3 | | | | |

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| hundred to thousands of meters (Goold, 1996). Other playback experiments have found that humpback whales will sing louder with a louder playback (Fristrup, et al., 2003). | | | | | | |
| Alternative IV | | | | | | |
| What is the justification for including only TTS and PTS in the criteria Level B harassment? Doing so appears to ignore the terms of the MMPA, which defines Level B harassment as “disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered.” The alternative is too narrow to fulfill the requirements of the MMPA. | | | | | | 25-1 |
| This alternative includes only TTS and PTS in the criteria for Level A harassment. The MMPA defines Level A harassment as “any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild”. Certainly TTS and PTS can count as injury, but indirect effects of noise – such as diversion from a critical feeding ground – can injure and kill marine mammals too. These alternatives are too narrow to fulfill the requirements of the MMPA. | | | | | | 25-2 |
| This alternative needs to define the criteria for deciding whether PTS onset minus 6 dB, PTS onset, or PTS onset plus 6 dB should be used as the standard for Level A harassment. No rationale for choosing between these is given. Similarly, what are the criteria for deciding whether Level B harassment occurs at TTS onset minus 6 dB, TTS onset, or PTS onset minus 6 dB? | | | | | | 25-3 |
| Alternative IV is described as more conservative than human noise standards, in that human standards allow some PTS from cumulative effects over a lifetime; it issues permits for individual projects, which typically last days to at most several years – far shorter than the lifetime of most marine mammals. How an NMFS (or anyone) possibly measure the cumulative lifetime exposure in wild animals? | | | | | | 25-16 |
| Alternatives IV, V and VI are nonviable given that we are unable to detect the onset of PTS. It would be a dangerous assumption to set levels at which PTS occurs, even if these are extrapolated, as is suggested. Particularly given the points raised above, regarding behavioral and physiological impacts occurring at levels below those at which the onset of PTS and even TTS can be expected. At this time there is not enough information to ensure that harm will not come to cetaceans at increased received sound levels. Therefore Alternatives IV – VI should be eliminated and, instead, more realistic and precautionary options should be pursued in | | 29-13 | | | | |

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| their place. | | | | | | |
| <p>NMMA agrees that noise levels which result in permanent hearing loss (e.g. irreversible cell damage which results in a meaningful change in hearing sensitivity) constitute a disturbance and that well-reasoned efforts should be taken to prevent such an outcome. Nevertheless, NMMA is unclear as to the basis for the 6 dB “safety” factor included in Alternative IV. NMFS should clarify the scientific basis for this criterion. With respect to Level B criterion in Alternative IV identifying disturbance as TTS onset minus 6 dB, NMMA reiterates its comments regarding TTS above. The Alternative V criteria should be expounded upon and discussed for other marine mammal species beyond the Gray Whale. When applied to the Gray Whale, it seems clear that this Alternative would likely have little impact on recreational watercraft, which are unlikely to reach even peak noise levels of 195 dB. Nevertheless, as the criteria are potentially subject to change within different functional hearing groups and for different marine mammals, NMMA would request that NMFS provide sound exposure levels for all other types of marine mammals in its proposed five functional hearing groups. NMMA is also concerned that the criteria outlined in these alternatives fails to account for variability in different marine environments as well as sound propagation characteristics.</p> | | | 32-24 | | | |
| <p>This alternative is not a realistic, scientifically defensible option.</p> | | | | | 36-18 | |
| <p>This alternative falls short of the MMPA’s definition of take and of affording marine mammals the protections required by law. It also does not allow for the consideration of non-auditory injury or for the impact of noise on marine mammal behavior. NMFS should replace this alternative with one that takes account both behavioral impacts and a broad range of physical impacts. The alternative should also account for what we know about different species, the characteristics of different noise sources, the settings of proposed actions, and the presence of any particularly sensitive noise receptors.</p> | | 38-6 | | | | |
| <p>Alternatives III through VI must define Level A harassment by taking account of potential non-auditory injuries as well as auditory ones, not based solely on TTS and PTS data, as now proposed. Auditory impacts are not the only, or even more important, form of injury to be suffered by marine mammals from ocean noise pollution; nor, as we have discussed with respect to strandings, do they necessarily occur at lower decibel levels than other forms of injury.</p> | | 38-7 | | | | |
| <p>Alternatives III-VI are insufficiently protective. 105 dB is sufficient to cause behavioral changes, and that is far below</p> | | | | | | 43-13 |

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| <p>the 160 dB and above levels envisioned in these alternatives. The criterion for Level A is 155-165 dB to 181-191 dB above threshold for mid-frequency cetaceans. A noise the same number of dB above threshold for a human would be far above the pain threshold. It is extremely difficult to produce a received level above 220 dB more than 10 meters from a source in water, meaning Alternative VI essentially defines Level A harassment as an impossibility.</p> | | | | | | |
| <p>Alternatives III-V contain acoustic criterion primarily focused on temporary threshold shifts (TTS) or permanent threshold shifts. These are both physiological responses of marine mammals to noise, and does not address behavioral responses (with the exception of Level B criterion for Alternative III, which indicates 50% behavioral avoidance). The MMPA defines harassment as "...any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the while [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, feeding, or sheltering [Level B harassment]." Simply indicating when a TTS or PTS occurs in the marine mammal ear does not take into account behavioral changes that may impact migration, breathing, nursing, feeding or sheltering. For instance, one study has found avoidance of sound sources at several hundred to thousands of meters (Goold, 1996). Other playback experiments have found that humpback whales will sing louder with a louder playback (Fristrup, et al., 2003).</p> | | 44-3 | | | | |
| Alternative V | | | | | | |
| <p>What is the justification for including only TTS and PTS in the criteria Level B harassment? Doing so appears to ignore the terms of the MMPA, which defines Level B harassment as "disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered." The alternative is too narrow to fulfill the requirements of the MMPA.</p> | | | | | | 25-1 |
| <p>This alternative includes only TTS and PTS in the criteria for Level A harassment. The MMPA defines Level A harassment as "any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild". Certainly TTS and PTS can count as injury, but indirect effects of noise – such as diversion from a critical feeding ground – can injure and kill marine</p> | | | | | | 25-2 |

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| mammals too. These alternatives are too narrow to fulfill the requirements of the MMPA. | | | | | | |
| This alternative needs to define the criteria for deciding whether PTS onset minus 6 dB, PTS onset, or PTS onset plus 6 dB should be used as the standard for Level A harassment. No rationale for choosing between these is given. Similarly, what are the criteria for deciding whether Level B harassment occurs at TTS onset minus 6 dB, TTS onset, or PTS onset minus 6 dB? | | | | | | 25-3 |
| Alternatives III through VI must define Level A harassment by taking account of potential non-auditory injuries as well as auditory ones, not based solely on TTS and PTS data, as now proposed. Auditory impacts are not the only, or even more important, form of injury to be suffered by marine mammals from ocean noise pollution; nor, as we have discussed with respect to strandings, do they necessarily occur at lower decibel levels than other forms of injury. | | 38-7 | | | | |
| Alternatives IV, V and VI are nonviable given that we are unable to detect the onset of PTS. It would be a dangerous assumption to set levels at which PTS occurs, even if these are extrapolated, as is suggested. Particularly given the points raised above, regarding behavioral and physiological impacts occurring at levels below those at which the onset of PTS and even TTS can be expected. At this time there is not enough information to ensure that harm will not come to cetaceans at increased received sound levels. Therefore Alternatives IV – VI should be eliminated and, instead, more realistic and precautionary options should be pursued in their place. | | 29-13 | | | | |
| NMMA agrees that noise levels which result in permanent hearing loss (e.g. irreversible cell damage which results in a meaningful change in hearing sensitivity) constitute a disturbance and that well-reasoned efforts should be taken to prevent such an outcome. Nevertheless, NMMA is unclear as to the basis for the 6 dB “safety” factor included in Alternative IV. NMFS should clarify the scientific basis for this criterion. With respect to Level B criterion in Alternative IV identifying disturbance as TTS onset minus 6 dB, NMMA reiterates its comments regarding TTS above. The Alternative V criteria should be expounded upon and discussed for other marine mammal species beyond the Gray Whale. When applied to the Gray Whale, it seems clear that this Alternative would likely have little impact on recreational watercraft, which are unlikely to reach even peak noise levels of 195 dB. Nevertheless, as the criteria are potentially subject to change within different functional hearing groups and for different marine mammals, NMMA would request that NMFS provide sound | | | 32-24 | | | |

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| exposure levels for all other types of marine mammals in its proposed five functional hearing groups. NMMA is also concerned that the criteria outlined in these alternatives fails to account for variability in different marine environments as well as sound propagation characteristics. | | | | | | |
| This alternative falls short of the MMPA's definition of take and of affording marine mammals the protections required by law. It also does not allow for the consideration of non-auditory injury or for the impact of noise on marine mammal behavior. NMFS should replace this alternative with one that takes account both behavioral impacts and a broad range of physical impacts. The alternative should also account for what we know about different species, the characteristics of different noise sources, the settings of proposed actions, and the presence of any particularly sensitive noise receptors. | | 38-6 | | | | |
| Navy experts agree that the most reasonable choice of criteria for Level A harassment would be PTS. The most reasonable choice of criteria for Level B harassment would be TTS, and, as appropriate, to address potential long-term sub-TTS biologically significant effects, a level 5 dB lower than TTS. | | | | | 36-19 | |
| Alternatives III-VI are insufficiently protective. 105 dB is sufficient to cause behavioral changes, and that is far below the 160 dB and above levels envisioned in these alternatives. The criterion for Level A is 155-165 dB to 181-191 dB above threshold for mid-frequency cetaceans. A noise the same number of dB above threshold for a human would be far above the pain threshold. It is extremely difficult to produce a received level above 220 dB more than 10 meters from a source in water, meaning Alternative VI essentially defines Level A harassment as an impossibility. | | | | | | 43-13 |
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| into account behavioral changes that may impact migration, breathing, nursing, feeding or sheltering. For instance, one study has found avoidance of sound sources at several hundred to thousands of meters (Goold, 1996). Other playback experiments have found that humpback whales will sing louder with a louder playback (Fristrup, et al., 2003). | | | | | | |
| Alternative VI | | | | | | |
| What is the justification for including only TTS and PTS in the criteria Level B harassment? Doing so appears to ignore the terms of the MMPA, which defines Level B harassment as “disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered.” The alternative is too narrow to fulfill the requirements of the MMPA. | | | | | | 25-1 |
| This alternative includes only TTS and PTS in the criteria for Level A harassment. The MMPA defines Level A harassment as “any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild”. Certainly TTS and PTS can count as injury, but indirect effects of noise – such as diversion from a critical feeding ground – can injure and kill marine mammals too. These alternatives are too narrow to fulfill the requirements of the MMPA. | | | | | | 25-2 |
| This alternative needs to define the criteria for deciding whether PTS onset minus 6 dB, PTS onset, or PTS onset plus 6 dB should be used as the standard for Level A harassment. No rationale for choosing between these is given. Similarly, what are the criteria for deciding whether Level B harassment occurs at TTS onset minus 6 dB, TTS onset, or PTS onset minus 6 dB? | | | | | | 25-3 |
| Alternatives III through VI must define Level A harassment by taking account of potential non-auditory injuries as well as auditory ones, not based solely on TTS and PTS data, as now proposed. Auditory impacts are not the only, or even more important, form of injury to be suffered by marine mammals from ocean noise pollution; nor, as we have discussed with respect to strandings, do they necessarily occur at lower decibel levels than other forms of injury. | | 38-7 | | | | |
| Alternatives IV, V and VI are nonviable given that we are unable to detect the onset of PTS. It would be a dangerous assumption to set levels at which PTS occurs, even if these are extrapolated, as is suggested. Particularly given the points raised above, regarding behavioral and physiological impacts occurring at levels below those at which the onset of PTS and even TTS can be expected. At this time there is | | 29-13 | | | | |

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| not enough information to ensure that harm will not come to cetaceans at increased received sound levels. Therefore Alternatives IV – VI should be eliminated and, instead, more realistic and precautionary options should be pursued in their place. | | | | | | |
| NMMA acknowledges that this alternative appears to be the most reasonable of the action alternatives, but we would reiterate our request to see the sound exposure thresholds for each of the marine mammals in the five functional hearing groups. In addition, NMMA is concerned that this alternative fails to account for the variables involved in sound propagation in specific marine environments. Although we do not wish to register direct opposition to this alternative, NMMA would prefer to retain the status quo and pursue scientific investigations which are specific to the hearing thresholds of specific marine mammal species, rather than relying on data extrapolations across functional hearing groups and across different marine mammal species.
Quite simply, to do otherwise would be premature. | | | 32-25 | | | |
| This alternative is too aggressive and indefensible. | | | | | 36-20 | |
| This alternative falls short of the MMPA’s definition of take and of affording marine mammals the protections required by law. It also does not allow for the consideration of non-auditory injury or for the impact of noise on marine mammal behavior. NMFS should replace this alternative with one that takes account both behavioral impacts and a broad range of physical impacts. The alternative should also account for what we know about different species, the characteristics of different noise sources, the settings of proposed actions, and the presence of any particularly sensitive noise receptors. | | 38-6 | | | | |
| Alternatives III-VI are insufficiently protective. 105 dB is sufficient to cause behavioral changes, and that is far below the 160 dB and above levels envisioned in these alternatives. The criterion for Level A is 155-165 dB to 181-191 dB above threshold for mid-frequency cetaceans. A noise the same number of dB above threshold for a human would be far above the pain threshold. It is extremely difficult to produce a received level above 220 dB more than 10 meters from a source in water, meaning Alternative VI essentially defines Level A harassment as an impossibility. | | | | | | 43-13 |
| Alternatives VI is also troubling, as includes a permanent threshold shift (PTS) onset for Level B criterion of harassment. This is simply unacceptable. PTS constitutes actual injury/permanent damage to the marine mammal ear, | | 44-5 | | | | |

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| and Level B harassment is reserved not for an act that “injures or has the significant potential to injure” (which is Level A harassment), but rather “disturbs or is likely to disturb a marine mammal.” Injury to an animal—in particular, permanent injury to a marine mammal—should not constitute Level B harassment. | | | | | | |
| Acoustic Data, Analysis, Criteria, and other Noise Considerations | | | | | | |
| All extrapolations, uncertainties and unknowns should be made explicit in the development of the criteria. | | 29-15 | | | | |
| Setting exposure levels is to rely on extrapolation. Some examples of this extrapolation are given, but no overall extrapolation procedure is given, and it is not clear how the extrapolation process will work. | | | | | | 25-8 |
| Continual monitoring and assessment of the program must be included as part of the DEIS to understand the potential changes in breeding and migration patterns due to possible changes in water temperature and climate. | 42-7 | | | | | |
| NMFS should document Data Quality Act (DQA) compliance in the administrative record of this proceeding and in the record of any further agency action involving the criteria. | | 47-2 | | | | |
| CRE cannot emphasize too strongly the need to ensure the public that models used by the acoustic criteria meet DQA standards. CRE urges NMFS to comply with those standards by adopting EPA’s models validation, verification, documentation, and disclosure process. | | 47-15 | | | | |
| Sound scientific data already available show that fall migrating bowheads are greatly impacted at received levels far below the 160 dB proposed in the Federal Register Notice for both <i>offshore drilling</i> and <i>seismic exploration</i> . See specific letter for examples of scientific surveys performed. | | | | | | 48-1 |
| The NMFS action proposes to use “energy flux density” in lieu of sound pressure level. While this metric expands on our understanding of how sounds works in water, it does not address how various animals integrate particle and pressure gradient energy into their perceptual surroundings. This is not to suggest that “energy flux density” be abandoned, but rather it speaks to the need for expanding the inquiry into the complexities of ocean sound perception. | | | 49-6 | | | |
| NMFS does not mention the acoustic group or process that came up with the matrix nor the upcoming peer-review publication in JASA presenting the matrix. If the public is to comment on the scope of the EIS and proposed alternatives then the public should have this information available to review. It may be premature to conduct a NEPA analysis on guidelines to implement the acoustic | | | | | 35-5 | |

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| matrix when the utility of the matrix has yet to be tested. We recommend that an appropriate interim approach would be to assess the utility of the matrix on a case-by-case basis during the MMPA permitting and authorization process (and ESA consultation process) before developing and adopting guidelines. | | | | | | |
| As a consequence, establishing permissible noise thresholds based on pitch and amplitude-weighted audiograms is probably omitting some important acoustical perceptions that fish have (and mammals are not adapted to). There are many arguments and much evidence that fish have a stronger need to evaluate time domain cues that are not pitch, or even amplitude related. These cues probably include rate of change, sound source direction, and the phase relationship between particle and pressure gradient information. For example, when a fish is swimming in chaotic (and loud) water currents, it needs to discriminate relatively minute perturbations in their local soundfield. This perceptual acuity is evident when a trout swimming in a frisky brook locates and captures a caddis fly that has touched the top of the water. The amplitude difference between the signals would indicate that the noise of the brook does not mask the sound of the caddis fly; these fish have some other way of deciphering delicate signals in an extremely "loud" soundfield. This may account for why fish subjected to high levels of certain types of acoustic energy (low frequency tones or air-gun blasts) may not seem harmed, but when they are subjected to rapid rise time impulse or high crest factor square wave energy at equal or even lower energy levels, the fish are damaged. | | | 37-6 | | | |
| The guidelines must allow for consideration of acoustic emissions that result in a net benefit to marine mammals such as acoustic signals emitted by ships to reduce whale mortalities from ship strikes. | | | | 45-6 | | |
| The development of the criteria calls for a large amount of extrapolation and the use of very limited data sets. How will this be reconciled? | 46-4 | | | | | |
| In order to be useful for regulatory purposes, the acoustic criteria should focus on assessment and regulation of acoustic effects on marine mammals at the population or stock level. | | 47-3 | | | | |
| The acoustic criteria should distinguish among various sound sources (e.g., sonar versus seismic) because they have different sound characteristics. | | 47-4 | | | | |
| Any models relevant to the acoustic criteria should be developed and used in a manner consistent with DQA standards. | | 47-5 | | | | |
| NMFS should state clearly whether any final acoustic | | 47-7 | | | | |

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| criteria will be binding on NMFS decision makers and explain how the criteria relate to the regulatory process. There should also be some mechanism for adapting final criteria to new studies and data. | | | | | | |
| CRE commends NMFS on its commitment to DQA pre-dissemination review for the acoustic criteria. | | 47-8 | | | | |
| The acoustic criteria should clearly distinguish among different sources, such as seismic and sonar. They should also address only population or stock level effects for each type of sound. | | 47-13 | | | | |
| Rather than basing a new regime of Ocean Noise Criteria on the existing standards, a workable ocean noise criteria should be developed to incorporate our growing understanding of the complex adaptations that various animals have to their habitat. They would account not only for how specific animals respond to acoustical stimulus in the presence of testing procedures, but also account for how the animal operates within their subject environment. These criteria could be similar to the architectural noise criteria that frame acceptable noise levels for various human-habitable species. Establishing ocean noise criteria would consider elements of both human/mechanical uses and natural/biological needs of the subject environments. Architectural noise criteria are established from two standpoints: the ambient noise within the environment, and the noise contribution of noise sources within the environment. Bringing these two standpoints together helps establish the noise criteria of the space and provides guidelines for the introduction of noise sources into that space. See specific letter for additional information. | | | 49-3 | | | |
| The main objective is to set up a protocol of establishing Ocean Noise Criteria based on the workings of the environment rather than the tolerance of various individual organisms that reside in it. | | | 49-4 | | | |
| The development of "Ocean Noise Criteria" has been needed, thus the proposed NMFS action is timely. Unfortunately, the proposed action outlined in the proposal falls short of what is needed and heads in the wrong direction. For an "Ocean Noise Criteria" to be effective, it would need the following provisions: <ol style="list-style-type: none"> 1. Be based on ecosystem considerations, not just focused individual species responses, 2. Include the impacts of noises on fish and marine invertebrates, 3. Include the synergistic and cumulative affects on marine animals, 4. Include the "energy flux density" and have provisions for other energy-time-domain | | | 49-7 | | | |

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| <p>integration as research yields more clarity on marine animal sound perception,</p> <p>5. Evaluate and set appropriate noise levels, incorporating human and animal uses of various habitats – with a focus on sustainability,</p> <p>6. Need to be precautionary (as to the potential damage to subject animals) and not based on thresholds of biological damage (such as TTS or PTS),</p> <p>Need to be open and flexible to incorporate advances in marine bio-acoustic research and improvements in technology.</p> | | | | | | |
| <p>For which species specifically will acoustic data be extrapolated? (e.g. for which species does NMFS feel data is inadequate to assign specific data?)</p> | | 16-7 | | | | |
| <p>It is also important to have reliable and uniform standards which are easily understood and, at the same time, enforceable by NMFS. Complicated formulas and assumptions, as well as species-by-species guidelines are not an acceptable substitute for a broad set of noise level criteria that apply in all oceans at all times.</p> | | 16-10 | | | | |
| <p>The proposal by NMFS to base their standards for noise levels only on “exposure levels and durations that may produce either temporary or permanent shifts in hearing sensitivity” is clearly a violation of the mandates of the MMPA and not in keeping with our understanding of noise impacts, including:</p> <ul style="list-style-type: none"> • Evidence of very low noise levels, as low as 130 dB, causing severe damage and strandings of beaked whales and baleen whales; • Evidence of post-cranial damage to marine mammals involved in strandings related to intense underwater noise levels; • Potential effects of resonance in marine mammal cranial passages, in effect magnifying intense underwater noise levels, to the point of damaging tissues; • Potential effects of rectified diffusion, with intense noise levels causing bubble formation in blood streams of cetaceans; • Potential effects of the startling of cetaceans at depth, which then flee to the surface and suffer decompression sickness (the “bends”); and • Low levels of underwater noise thought damaging to human divers (e.g. above 145 dB). <p>The US Navy has determined a “safe” level of underwater noise for human divers at 145 dB, based on concerns for adverse effects on humans at higher levels of noise. It has</p> | | 16-12 | | | | |

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| <p>been assumed by NMFS that humans would be LESS adversely affected by underwater noise than marine mammals. However, the opposite conclusion is also possible:</p> <ul style="list-style-type: none"> • The level the Navy recommends for humans is a “safe” level that would not cause direct permanent harm, but the MMPA calls for no “harassment” of marine mammals, a much lower biological standard than proving physical harm. • Humans do not dive to depths that marine mammals routinely dive to, so that sound impacts at depth, that may be considerably larger than at the surface, may not apply to humans but would become dangerous for marine mammals. • As humans are not aquatic animals, measurable impacts on humans from underwater sound may in fact result from sound levels quite a bit higher than marine mammal impacts. | | | | | | |
| <p>We believe a level of 120 dB received sound in pulses and 100 dB in constant sound (including repeated pulses) by marine mammals would be a conservative and valid noise level to avoid harassment. In part, this is based on research showing cetaceans aware of and reacting to noise impulses in the range of 90-110 dB.</p> | | 16-13 | | | | |
| <p>Additional support for this level of underwater noise comes from scientific research related to the multi-species strandings of beaked and minke whales in Bahamas on March 15, 2000.</p> <p>The Bahamas Journal of Science reports the conclusions of Kenneth Balcomb and Diane Claridge that “(a)version evidently and repeatedly occurred for these cetaceans at levels of somewhere between 140 and 180 dB ...(probably nearer the former)...”</p> <p>The calculated received noise levels in that incident were further reduced in follow-up work by Balcomb and John Hildebrand of Scripps Institution of Oceanography and reported at the Third Plenary Meeting of the Advisory Committee on Acoustic Impacts on Marine Mammals in San Francisco. Their modeling of the event suggest a mean level of exposure to noise in the range of 130-140 dB, and extremely unlikely that exposures louder than 160 dB occurred. Again, I stress these levels induced severe tissue damage and strandings of the cetaceans in that incident, far below a level for “harassment.”</p> | | 16-14 | | | | |
| <p>The existing evidence suggests that a 120 dB received sound level in pulses, and 100 dB for constant underwater</p> | | 16-16 | | | | |

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| <p>noise (including repeated pulses), would address current concerns for the welfare and avoid harassment of marine mammals. These levels are considerably lower than current levels, but the scientific data for strandings in relationship to use of intense noise sources combined with limited experimental work with very low levels of sound showing short-term behavior changes all suggest these levels meet the criteria of the MMPA.</p> <p>Current NMFS sound levels cannot be justified by scientific research. The assumption that threshold shift data will establish “safe” levels of underwater noise for marine mammals is flawed and does not comport with experimental data.</p> <p>It is important that NMFS take this opportunity to reduce noise level criteria for marine mammals to levels that are in line with the best available science.</p> | | | | | | |
| <p>Effects of masking appear not to be covered in the description of Level B harassment. But masking could well be a significant effect for some noise sources, particularly for noise sources that persist for weeks to months like shipping, drilling and production of oils and gas, wind farms, etc.</p> | | | | | | 25-5 |
| <p>Five functional hearing groups of marine mammals are defined, with some exceptions allowed. Given how much remains to be learned about marine mammal hearing, is there any provision for future splitting of these groups into more numerous categories?</p> | | | | | | 25-6 |
| <p>The proposed methods will result in a set of decibel levels for each of the five functional hearing groups and each of the four categories of noise. Setting a decibel level is relatively simple, but it does not at all capture the complexity of marine mammal responses to noise. Is any provision made for other measures such as the nature of the sound? Some sounds are clearly more disturbing to animals than others in the same frequency band.</p> | | | | | | 25-9 |
| <p>Because the variability and complexity of marine mammal responses to various types of noise, if standards are based only on decibel levels, a large measure of conservativeness (20 dB? 40db?) should be incorporated into the standards.</p> | | | | | | 25-10 |
| <p>Why not divide marine mammals into groups by the depths of their dives? There is good reason to believe that deep divers are more vulnerable to noise impacts and should be treated separately.</p> | | | | | | 28-4 |
| <p>Even if the focus is almost entirely on PTS and TTS, this Notice of Intent seems to gloss over the fact that PTS has never been studied in marine mammals, that only a handful</p> | | | | | | 28-5 |

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| <p>of studies have examined TTS in marine mammals and never in the wild, and that, indeed, we don't even have empirical knowledge of what most cetaceans can actually hear. Moreover, any calculation of exposure presupposes that one knows where the animal is located in the sound field. Unless one plans to tag each individual with an acoustic tag, I see no way of accurately determining noise exposure. In short, there is a huge amount of guesswork in this process. While this may be unavoidable, there is no excuse for abandoning precaution in the face of such vast uncertainty.</p> | | | | | | |
| <p>A "science-based" approach to management based on "empirical data" requires that all reasonable interpretations and explanations of the results be considered and viewed in light of the limitations of a particular study. All scenarios of possible impacts need to be contemplated. I believe this Notice of Intent fails in this regard. There is a myopic preoccupation with direct auditory damage to the exclusion of practically all other impacts. Just because these data are more readily obtainable (from captive animals), does not mean they are the most important for the conservation of marine mammals. It is poor science to ignore other studies that do not fit into your "scheme". The failure to incorporate the work on beaked whales and sonar into these acoustic criteria is a grave omission. Equally lost is the cautionary lesson this phenomenon should have taught us, the scientists as well as the managers.</p> | | | | | | 28-9 |
| <p>The Notice states that it will 'use data from one species of mammals to set criteria for another species is acceptable for injury because the anatomy of the inner ear of all mammals is extremely similar'. Whilst this may be the case for auditory injury, we do not believe that such peer reviewed data are available for behavioral or physiological impacts. In fact, the best data may be that which was presented at the 3rd Advisory Committee meeting on the Impacts of Noise on Marine Mammals. Amongst other things this indicated that the beaked whales in the Bahamas during the 2000 stranding that washed ashore and ultimately died were probably exposed to levels lower than those that have been shown to cause TTS in captive odontocetes.</p> | | | | | | 29-5 |
| <p>We are concerned that data from a few captive odontocetes will be extrapolated to set management measures for all cetacean species whose vulnerability and responses can be expected to vary greatly. Whilst the marine mammals have been grouped depending on their hearing abilities, this may not be appropriate.</p> | | | | | | 29-6 |
| <p>A thorough investigation of all noise sources is required. This should include seismic surveying, shipping, military</p> | | | | | | 29-7 |

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| <p>activities (including, but not limited to, sonar exercises) and the use of active acoustic fisheries devices. Efforts should be made to ensure that all industries that may be having a significant impact on the marine environment be managed appropriately. A full independent review of the potential impacts of all sources of noise pollution on cetaceans would provide a firm knowledge basis to help determine how best to proceed with comprehensive and effective acoustic guidelines for those industries to which the legislation should apply.</p> | | | | | | |
| <p>For the NMFS to suggest these increases in allowable sound after over a decade of strandings coincident with acoustic events reveals an obvious flaw in the process. A cursory glance at the funding sources behind the scientists on whose work the criteria are based shows why – every one has either worked for, presently receives, or has received funding from either the US military or the oil and gas industry. Industry involvement in the crafting of government regulations meant to control them defines corruption, a point we have pointed out on numerous occasions and most recently in a letter to the members of the Acoustic Committee on which NMFS is represented, and that incidentally, has yet to report to Congress on its findings.</p> | | 30-4 | | | | |
| <p>CSI supports the matrix approach, and agrees that the generic 180/160/120 values may be too simplistic, but we cannot understand how professional scientists can accept the presented matrix as reality based. It is essentially equal to the one publicly presented in April 2004, suggesting no influx of data and a fixed conclusion. If the process is not adapting to new information, or supporting and seeking better facts, why should the public not conclude that the DEIS conclusions are unofficially set?</p> | | 31-7 | | | | |
| <p>The matrix criteria categorize all anthropogenic sounds into single pulses, single non-pulses, multiple pulses in a series; and multiple non-pulses in a series. Where do seismic surveys fit? Recent experience with the R/V Ewing in the Gulf of Mexico demonstrated that, to a marine mammal, the noise of the full array is perceived as a constant din for so many hours that the matrix criteria seem meaningless. The animals may have many reasons for not leaving the zone, but the simplest is that they may not know which way to go to escape. The cumulative effect of effectively constant noise over very long periods must be addressed based on perceived reality, not the frequency of pulses per array over time. Cumulative noise damage is of personal concern to me: my 40 year flying career has resulted in five distinct and constant sounds that mask a wide range of frequencies.</p> | | 31-8 | | | | |

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| I am convinced that many anthropogenic sources are causing similar effects, but I am more convinced that most experts would be more precautionary if they had to hear what I hear when surrounded by silence. | | | | | | |
| Audiogram results plus assumed values are used to define TTS and PTS onset. They have little value defining onset of significant biological behavioral response, which is where the noise problem begins in many cases. More than 80% of the species of concern for sound impacts have no direct behavioral hearing data, or the data rests in ignored non-peer-reviewed, often anecdotal reports. | | 31-9 | | | | |
| Discussions of individual variability are not reflected in the matrix, where the fundamental assumption is that minimal data on TTS and PTS onset studies of a handful of prime-age, healthy, disciplined, captive marine mammals accommodated to experimentation, can be logically extrapolated to all marine mammals under all conditions. Yet a comparison of TTS studies finds up to 50dB range between individual sensitivity. Consider for a moment the problems of representing human TTS and PTS onset from tests using only military personnel. But even that would be more acceptable than inferring thresholds of baleen whales from a few highly conditioned captive dolphins. | | 31-10 | | | | |
| The FR Notice for the noise exposure criteria states that some terrestrial mammal data is used, including human data. This may be a significant change from previous agency opinion, which will be explored later by many; the DEIS can expect comments relating to earlier statements arguing for the exclusion of human data, for example the US Navy 145dB exposure rule. The implication is for mixing apples and oranges, depending upon the conclusion desired. For the LFA it was necessary to ignore values as low as 145 dB for potential marine mammal impacts, as the geographical area affected would have been enormous. Now allowing human data may serve a different purpose. | | 31-11 | | | | |
| Perhaps what needs to be quantified at this point is the characteristic of meaningful noise, allowing for a sound that may be perceived as a learned threat, such as gray whales hearing a screeching chain as distant orcas. Noise represents objects and situations to animals, not power levels. Given the reality of human predation on Latin America's franciscana it appears that the sound of any approaching boat elicits avoidance. When was the last time you saw a photo of a live franciscana in the wild? In that context a specific noise well below TTS onset, and perhaps even below ambient, may induce biologically significant behaviors; one boat could deny habitat to an entire population. Marine mammals are assumed to have evolved | | 31-16 | | | | |

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| <p>capacities to detect significant sounds below ambient, so the key is the significance of the sounds to the animals. That can be estimated for many species from hundreds of reports and peer reviewed papers. Yes, the matrix could become even more cumbersome with more variables included, but meaningful noise characteristics should be considered, as many sounds would not be heard as possible threats, and their allowable levels could be increased.</p> <p>A specific example of meaningful noise is Nowacek, Johnson and Tyack's "North Atlantic right whales (<i>Eubalaena glacialis</i>) ignore ships but respond to alerting stimuli". Five out of six whales responded to an alerting stimulus at received levels of only 133–148 dB, by stopping their foraging and swimming towards the surface. The disruption was temporary but significant, as the energetic needs of right whales may not be met during lean years because of patchy prey distribution, with a demonstrated impact on population recruitment. What if, to the whales, the alert stimulus was similar to something natural to which they feel compelled to respond, or what if right whales often respond this way to most novel stimuli? Is it possible the cumulative disruptions may reach biological significance? If any of these novel stimuli are anthropogenic they must be included in all the other massive efforts to constrain human activities to save this population. The matrix must take such examples into account.</p> <p>Reinforcing the significance of behavioral reactions, Tyack has also written: "some acoustic activities may impact enough of a species' habitat to raise concerns that animals may not be able to use the habitat as effectively. A 25% reduction in feeding or interference with communication used in the mating system could have a much larger effect on a population than a few accidents where animals come so close to sources that their hearing is affected." Again the <i>fransiscana</i> come to mind, as examples where meaningful noise may produce reactions that deny habitat at SPLs far below TTS onset, and even at or below ambient.</p> | | | | | | |
| <p>The DEIS discussion of the "Behavioral Disturbance Criteria 24-hour Rule" would benefit from a thorough description of intent and scenarios well beyond what has publicly been provided. The trailing caveat, "the disturbance would not be considered biologically significant unless there is specific contrary evidence," is not very clear, as there seem to be many scenarios where a habitat denied for less than 24 hours as a result of noise would still be biologically significant.</p> | | 31-17 | | | | |

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| <p>How are reactions to meaningful sounds to be documented? CSI believes that controlled exposure experiments (CEE) offer considerable potential for documenting subtle behavioral responses to noise that may be biologically significant, yet far below TTS. Perhaps more important, there may be no better way to add data to raise the matrix assumptions into scientifically credible values. However, CEE's should never cause adverse impact, and CSI cannot support many CEE projects that we know of out of concerns for animal welfare. While we are disgusted with the illogical and unethical efforts to derive TTS from dying, stranded baleen whales, and do not support invasive tagging, we support with enthusiasm the CEE studies of right whale ship alerts with suction cup tagging. CSI also supported the LFA SRP project to ensonify gray whales during migration, because the methodology was particularly sensitive to the whales' welfare. That research demonstrated 50% aversion from the inshore source at 138dB, and can be used as a sample of context dependent results. Many studies of harbor porpoise and pingers demonstrate both aversion and accommodation (habituation), but we are not convinced that NMFS is using the latest information from EU research.</p> <p>CEE's are deservedly controversial, because subjecting marine mammals to noise intended to alter behavior skirts ethical guidelines, guarantees media attention and NGO probes, may result in lawsuits, and may be difficult to fund as a result. Beyond these complications, CEE's are not common because of the gratifying reluctance of most scientists to subject marine mammals to disruption and injury. But what about making studies that use anthropogenic noise events that may cause disruptions anyway? Why are these opportunities missed? Certainly there is a control problem, and few projects want to be dependent upon a time schedule forced on them, but the opportunities exist, and are missed constantly. For example, the Navy has refused CSI's request to tell even security-cleared scientists when and where operations would be conducted, in part so that qualified necropsy teams could be on standby to make the best use of any strandings. Another reason would be to initiate a concurrent CEE project documenting cetacean distribution before, during and after the event, and the noise field generated near the cetaceans by the event. Although publicly stating their support for noise solutions, and with full control over security issues, the Navy is preventing access to research opportunities to provide such solutions.</p> | | 31-18 | | | | |
| <p>It is clear that most observations of behavioral reactions to</p> | | 31- | | | | |

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| <p>noise are inadequate. Reports abound of apparent lack of behavioral responses to significant noise, such as finbacks passing by calving glaciers, or sperm whales continuing to forage while enveloped by seismic survey sounds. These events are assumed to demonstrate that there was no biologically significant reaction, but it is more factual to admit that the observations were unable to define one. That a response is too subtle for current analytical abilities does not mean that the response was not biologically significant, particularly long term. Again, tagging to determine responses to perceived noises may help to fill the gaps.</p> | | 21 | | | | |
| <p>Species living in strong social units, such as pilot, melon-headed, false killer and killer whales, have been documented in situations suggesting extreme aversion to sonars, such as the Shoup's transit of Haro Strait, strandings in Taiwan, or unusual sheltering in a bay in Hawaii. The DEIS must accept these types of events as deserving of attention, rather than dismissing them as purely anecdotal or not sufficiently controlled. Many very social species may react or not react to stimuli because of the actions of the leaders. If the leader is extremely impacted by a specific sound and blunders ashore, it is possible for the behavioral change in one individual to cause a biologically significant result as the whole group is lost.</p> | | 31-22 | | | | |
| <p>With reference to the resources listed on the NMFS website, CSI urges consideration of the IWC SC/56/Annex K, Report of the Standing Working Group on Environmental Concerns, which we could not find listed. Also of value are a seminal discussion paper by William Evans, and several international papers, such as the relationship between seismic surveys and species diversity in Brazil. We especially recommend several papers that should become available from the 2005 meeting of the ECS. Studies and data relating to anthropogenic marine noise are becoming available all the time. If it is acceptable to construct a complex matrix to represent entire genera based on a very small sample of selected individuals, then it is equally acceptable to admit evidence and potentials from the non-peer-reviewed reports of behavioral impacts that are everywhere. If a handful of TTS and PTS studies can be magnified to relate to all marine mammals, it is logical to include non-peer-reviewed observations of behavioral responses of marine mammals to loud underwater noises. Much work on fishes has demonstrated that swim bladder damage results from seismic surveys, and that it is more pervasive, and occurs at lower sound levels and in shorter exposure durations, than previously suspected. In a Norwegian study conducted in the central Barents Sea,</p> | | 31-23 | | | | |

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| seismic shooting severely affected fish distribution, local abundance, and catch rates over a large geographic area. | | | | | | |
| The National Marine Manufacturers Association and its membership are steadfastly committed to sound environmental stewardship. The association and its membership appreciate the need to protect important wildlife, particularly marine mammals. Nevertheless, NMMA has some concerns and questions regarding the available science upon which new sound exposure criteria will be based. | | | 32-1 | | | |
| NMMA is pleased to present its perspective on sound exposure criteria, and our comments will focus largely on determining the true impact of this current effort on the recreational boating community poses significant challenges due to shortfalls in information provided by the Agency in its Notice of Intent and at its scoping meetings. | | | 32-3 | | | |
| The existing base of research on marine mammal hearing, auditory threshold levels, biologically significant disturbance, and noise levels from various sources suffers from numerous—and substantial—knowledge gaps, hinders the current effort to establish new sound exposure criteria to such a degree that the effort should be postponed. | | | 32-4 | | | |
| In its Notice of Intent, NMFS indicates its desire to establish a new set of criteria based on varying levels of TTS and PTS onset, and, in Alternative III, behavioral avoidance. The Agency provides an example by way of the Gray Whale, for which it specifically applies its proposed noise exposure criteria based on the limited auditory information available. NMMA and other stakeholders will be unable to provide meaningful comment on the appropriate scope of an EIS and to assess whether new criteria would impact our interests unless NMFS provides a similar chart outlining the sound exposure thresholds for each mammal species in the five functional hearing groups for which these guidelines are to be used. Since some limited direct TTS studies have actually been conducted with bottlenose dolphins and a beluga whale, one individual harbor seal, one individual northern elephant seal and California sea lions subjects, the Agency should demonstrate the proposed application for mid- and high-frequency cetaceans as well as underwater and above water pinnipeds as it has extrapolated for the Gray Whale. We realize this would be a significant undertaking, but we feel it would substantially aid the ability of stakeholders to comment in a meaningful way. The National Environmental Policy Act scoping process is intended to make impact statements more relevant by clarifying the issues to be discussed in an Environmental Impact Statement. In our view, the Agency has not properly | | | 32-6 | | | |

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| <p>identified the proposed agency action, making it impossible for the public to assist the agency by identifying its concerns. Until the Agency is able to provide specific sound exposure levels for all classes of marine mammals and for all alternatives, this scoping process and any Draft Environmental Impact Statement prepared subsequently will be deficient.</p> | | | | | | |
| <p>Even as interest in underwater acoustics and ocean noise has grown over the last several years, research has often failed to keep pace with demand. To be sure, researchers have made significant advances in data collection and have generally expanded our understanding of how some, though not nearly all, marine mammals hear and why sound is biologically important. But serious gaps in knowledge persist and considerable research remains to be done before any regulatory effort which strives to be “science-based” can occur. Clearly, responsible management must concern itself with locating a balance between the risks posed by overregulation and those posed by under regulation—in the case of marine mammals and ocean noise, the extent of scientific uncertainty should give considerable pause to federal resource managers as they move forward with any attempt to significantly modify status quo guidelines and regulations. NMMA is not alone in concluding that scientific uncertainty in this field is substantial. A 2003 study, Ocean Noise and Marine Mammals, by the Oceans Studies Board of the National Research Council (NRC) takes a comprehensive look at the body of existing research on marine mammals and ocean noise. This study characterizes the effect of anthropogenic noise on marine mammals as one of the “least understood subjects” in marine science, further noting that “remarkably few details are known about the characteristics of ocean noise, whether it be of “human or natural origin, and much less is understood of the impact of noise on the short- and long-term well-being of marine mammals and the ecosystems on which they depend.” In addition, the U.S. Commission on Ocean Policy’s (USCOP) Final Report, An Ocean Blueprint for the 21st Century, makes its clear that “very little is known about marine mammal physiology, including baseline data on hearing, making it difficult to assess the potential biophysical impacts of noise on marine animals.” Although it is widely assumed that noise impacts marine environments, the impacts associated with natural geophysical and biological sounds (ambient noise) and those induced by human beings through various ocean activities are not easily parsed out, and in many situations and environments, impossible to segregate. The National</p> | | | 32-14 | | | |

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| <p>Research Council study, which reviewed all available data, found “no documented evidence of ocean noise being the direct physiological agent of marine mammal death under any circumstance” The 192-page report lays out a series of recommendations for improving research on marine mammals and noise, highlighting the substantial lack of knowledge in this field. In 2005, NRC released another report on marine mammals and ocean noise which reveals that many of its earlier recommendations for additional research remain unmet. Although NRC developed a new conceptual model potentially capable of determining biologically significant impacts associated with sound in the marine environment, the report concluded that such a model will lack functionality for at least a decade until and unless additional research is completed. Moreover, the U.S. Ocean Commission in its Final Report makes clear that federal agencies must expand their research efforts as well as improve data dissemination in order to fully understand marine mammal interactions with sound. NMMA strongly supports additional scientific research pursuant to NRC and U.S. Ocean Commission recommendations. NMMA as well as acousticians and marine mammal bio-acousticians understand that there are various parameters still uncalibrated or even measured that effect any proposed modeling effort. The simplest parameters, like calibrated source levels and spectrums of specific noise sources; direct physical oceanographic data and site specific bathymetry; sound speed profiles; and transmission loss and propagation curves unique to specific habitats and influenced by various times of the day, season and climatic conditions, need to be measured. In addition to these parameters, more research is needed on the hearing abilities of each species group of concern, such as their representative audiograms, critical masking ratios for various types of sounds, critical bandwidths of hearing, directional hearing, temporary threshold shifts for various types of sounds and the source levels and spectra of their vocalizations. Still unknown are the actual sound fields that directly cause measurable and statistically significant disturbances that affect the health of the populations. Until such research is undertaken, it seems clear that models and matrices are not operable and should not form the basis of regulatory decisions. The public and stakeholders will lack confidence in Agency management decisions related to sound if the Agency proceeds at this time. NMFS, for its part, acknowledges the paucity of current data, indicating that “there are no direct data on the effects of many kinds of sound on many species of marine mammals,” and that it will be necessary to “extrapolate” to</p> | | | | | | |

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| <p>“cover cases of missing data.” The lack of science in this area coupled with the agency’s desire to move forward with more specific guidelines signals that NMFS plans to pursue a precautionary approach to management, something with which NMMA has reservations. NMMA feels strongly that NMFS should, prior to establishing new sound exposure threshold criteria, initiate a comprehensive research program which seeks to dramatically improve scientific data in this area. This research program should be fully transparent and include public participation and review from the beginning. Only once the research is completed should NMFS begin developing sound exposure threshold guidelines for marine mammals.</p> | | | | | | |
| <p>Of particular concern to NMMA is the lack of scientific understanding of what constitutes “meaningful biological disturbance” from marine sound in both the short- and long-term. Although little is known about marine mammals and noise in general, even less is understood about biologically significant disturbance. Long-term effects of noise on individuals and particularly on populations are not known. In many instances, studies that refer to noise effects, particularly of recreational boats, have failed to convincingly parse out noise from physical presence or surface activities. Unfortunately, this has not restrained biologists from making inferences about sound impacts without the benefit of careful acoustical measurements and calibrated acoustical data. It is widely known that scientific investigation into the “biology of disturbance” has not been pursued in a comprehensive manner. Accurate assessments of biologically statistically significant impacts from noise are, in most instances, simply infeasible without great leaps of faith in which scientists and regulators rely on a myriad of assumptions and extrapolations. Animal reactions are varied and individuals in social populations or groups can react to the same stimuli differently depending upon the social mix and activities of the group. Determining when a specific noise disrupts normal animal behavior is a difficult task. Even more challenging to determine is whether responses are direct or indirect, and whether there is any biological relevance to an individual’s fitness, never mind the population at large. The challenge for biologists and acousticians is documenting when a biologically significant behavioral avoidance occurs, and when such avoidance is statistically significant for a marine mammal population. At present, NMFS can do neither. Much of the existing research on avoidance is based on data gathered from non-repeatable observational studies. Observational studies may prove correlation; they do not prove causation. Indeed,</p> | | | 32-17 | | | |

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| <p>“current knowledge is insufficient to predict which behavioral responses to anthropogenic sounds will result in significant population consequences for marine mammals.” Until, as recommended by NRC in its most recent assessment, scientific research moves beyond observational, correlation data to controlled exposure, dose-response experiments, decision-makers will lack the necessary statistical information regarding likelihood of acoustic reactions across marine mammal species to noise stimuli as well as any meaningful understanding of whether those reactions are biologically important for the animal. That the overwhelming majority of studies are correlation calls into question the validity of NOAA’s current efforts to rewrite the guidelines. More specifically, it calls into question the scientific basis for the proposed alternatives.</p> <p>NRC has developed a model with which regulators, policymakers, and researchers can assess the potential impacts of acoustic disturbances on marine mammals, although the current state of scientific research led NRC to conclude that “we are a decade or more away from having the data and understanding of the transfer functions needed to turn such a conceptual model into a functional, implementable tool.” It seems abundantly clear to NMMA that NMFS should shift its focus and rededicate its available resources to collecting the data and conducting the research needed to make NRC’s conceptual model a viable management tool. In any case, the National Research Council and the U.S. Commission on Ocean Policy have emphasized the need to restore balance and common sense to management by assessing risks to marine mammals with an eye toward biologically and statistically significant disturbance. Both NRC and USCOP have recommended statutory changes to the current definitions of “harassment” under the Marine Mammal Protection Act. In 2000, NRC re-emphasized its previous recommendation to focus on biologically significant disturbances, something which it again reiterated in its 2005 report. More than that, however, NRC modified its recommendation to encourage regulators and researchers to focus on “statistically significant and biologically significant changes in behavior.” In other words, that sound may result in behavioral changes does not mean these changes are either biologically significant or statistically significant for the mammal population at large. In some cases, as with the manatee population, avoidance of the boat by the animal is a positive reaction, something which is reflected in the existing manatee management regime in Florida. In any case, researchers must increase</p> | | | | | | |

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| their understanding of how short-term behavioral changes impact the larger mammal population. | | | | | | |
| <p>To the extent that marine acousticians increasingly view ocean noise as a cumulative issue, it is important to point out that existing information is extremely limited with respect to underwater noise emissions from anthropogenic sound sources. While, for example, the underwater sound characteristics of a commercial shipping vessel are known, the total contribution of commercial shipping to the ocean noise budget is not. As it stands, “data regarding noise produced by shipping, seismic surveying, oil and gas production, marine and coastal construction, and other marine activities are either not known or are difficult to analyze because they are maintained by separate organizations.” With respect to recreational boating and private vessel traffic, NRC is clear that underwater sound contributions for recreational watercraft “have not been quantified.” It has been noted, however, that “pleasure craft do not contribute significantly to the global ocean acoustic environment,” although, to be fair, NRC does indicate that some boats could have impacts in specific local marine environments.</p> <p>The conclusion by NRC, and what appears to be a general assumption within the regulatory community, that sound from recreational watercraft negatively impacts marine mammals and other wildlife is purely speculative. First, virtually no reliable research on underwater sound levels from recreational boats has been conducted. Calibrated acoustical measurements of spectra and source levels of the myriad of craft are not available. Subsequent propeller noise propagation tests of different boat types in highly site-specific areas have not been conducted. In many of the shallow estuarine and coastal habitats frequented by recreational boaters, the dominant sound spectra produced by recreational watercraft may not propagate or add to ambient noise below the specific frequency cut off limits that are defined by these habitats. Second, a European Commission report indicates that, at present, “no firm criteria for airborne or underwater sound, nor [sic] reliable underwater sound level data are available to evaluate the impact of the use of recreational craft on wildlife.” Although some biologists have attempted to evaluate underwater sound emissions from boats, these studies have generally employed flawed methodologies and utilized uncalibrated estimates of source levels in poorly defined sound fields. With respect to recreational watercraft, reliable acoustical data should be obtained with standardized</p> | | | 32-18 | | | |

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| <p>measurement methods that are relevant for the type of craft, its operation, and the specific environment of concern. For personal watercraft (PWC), no calibrated underwater sound level data are available. Since meaningful acoustical data have not been collected, the available studies and inferred negative impacts from sound from recreational boats are baseless. Considerable research remains to be done before any reliable conclusions can be made.</p> | | | | | | |
| <p>NMMA supports and encourages additional research related to marine mammals and ocean noise. It is clear that significant knowledge gaps exist and that scientists and policymakers need more information in order to make well-reasoned policy decisions. NMMA applauds NOAA and its partners for the considerable progress they have made in recent years and hopes the Agency recognizes that additional research, both empirical and theoretical, will bolster its ability to protect marine mammals while avoiding onerous and unnecessary restrictions on the regulated community. It is the position of NMMA that all regulatory efforts and federal policy should be guided and informed by sound science, which is capable of withstanding a rigorous peer review by independent experts in accordance with the Office of Management and Budget (OMB) peer review bulletin and which is subject to extensive public scrutiny and review. Should sound science not be immediately available, the Agency should strive to obtain it rather than relying strictly on a precautionary approach to management, an often imperfect and overly-broad regulatory tool that can function as a disincentive to developing a larger scientific understanding on the natural resource in question. Ultimately, NMMA believes that the application of sound science in regulatory decision making will enhance marine resource management, leading to the most effective—and the most equitable—regulations, should they be deemed necessary.</p> | | | 32-19 | | | |
| <p>It is important that you consider the waveform of the signal (noise source). In particular, square wave signals are likely to trigger a more dramatic biological response than sine wave signals or organic/natural sounds. I realize that little research has been done on this, but subjective experience, as well as current understanding of auditory signal processing, suggests that there is a need to consider this question. The recent introduction of relatively intense digital noise sources heightens the importance of this point.</p> | | | | | | 33-1 |
| <p>In the DEIS, please specify which species for which NMFS feels there is enough data to use the matrix directly, and which species will involve extrapolation of data from others.</p> | | | | | | 33-2 |

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| <p>There is evidence of severe impacts at relatively low dB levels (most prominently, with the beaked whales in the Bahamas), whether these impacts are caused by physiological (acoustic resonance/rectified diffusion) or behavioral (rapid surfacing) factors. These and other physiological and behavioral effects are not sufficiently addressed by the TTS/PTS criteria.</p> | | | | | | 33-4 |
| <p>Interpretation of precautionary approach/principle – Even though NMFS is using a “conservative” approach, utilizing (your understanding of) the lowest levels shown to cause a response, you are still operating on a principle of the burden of proof being to show harm. That is, you are picking the level that is shown to be harmful, but being conservative the choice. You are not placing burden of proof on showing that there is no harm, as suggested even in the (rather convoluted) definition of the Precautionary Principle used in the April 2004 NMFS presentation to the MMC panel. To do so would mean having standards that are clearly harmless, and only increasing them in response to clear evidence that harmlessness remains at higher levels. The sound levels that are clearly harmless are much lower than those proposed; they would need to be levels where there is little or no behavioral response at all. I say this not to necessarily advocate for such a strict precautionary approach, but to note that your approach falls short of the fundamental definition of precautionary standards.</p> | | | | | | 33-7 |
| <p>Species-specific (functional hearing groups) approach – I can see the appeal of this, as responses and sensitivities vary widely. But it is very rare that a noise source will impact only one species or hearing group; the complex web of overlaying permitting that may be implied by the new approach seems unwieldy. It would be preferable to set overall noise standards at levels reflecting the most sensitive species present. Responses have been observed in some conditions at sound levels of 130-160dB (mortality in Bahamas beaked whales), 90-130dB (behavioral changes and avoidance in Hawaii ATOC tests), and 120-150dB (reduced singing by humpbacks in Hawaii ATOC tests). None of these responses would be addressed under the proposed criteria; it is also important to recognize that we are as yet NOT aware of all the “conditions” that can lead to these responses. Granted, except for the Bahamas incident, these are short-term behavioral impacts; yet many sound sources to be regulated under the new standards (most strikingly seismic surveys) entail rather large areas at received levels of 90-150dB for extended periods (days to weeks).</p> | | | | | | 33-8 |
| <p>By focusing on acute damage (PTS/TTS), you may be</p> | | | | | | 33-9 |

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| <p>missing impacts with more biological importance; it IS true that most mobile species swim away from noise before it's physiologically damaging. However, harassment by noise is far more widespread and needs to be addressed. Thus ambient noise criteria may be more effective way to deal with (especially) Level B harassment. Even with the new stricter readings of Level B harassment (significant potential/likely to disturb/abandon or significantly alter behavior), a precautionary approach would reserve judgment on many long-term effects and regulate with care until long-term studies clarify the uncertainties.</p> | | | | | | |
| <p>This is undoubtedly complex, and there is missing data; of course, the same can easily be said for the Alternatives presently being considered. As with the individual species TTS/PTS approach, there is a need for much more comprehensive baseline data on which to ground this approach to Ocean Noise Criteria. However, both current capability and rapidly developing technological systems can provide the needed ambient noise data.</p> <p>Existing hydrophone arrays include the US Navy's SOSUS (Sound Surveillance System) and IUSS (Integrated Undersea Surveillance System) and the PMEL (Pacific Marine Environmental Laboratory) autonomous hydrophone arrays (HARU), which have been deployed in both the Pacific and Atlantic Oceans. Meanwhile, networks of unmanned underwater observatories and data collection points such as the inter-related NEPTUNE (North-East Pacific Time-series Undersea Networked Experiments), VENUS (Victoria Experimental Network Under the Sea), and ORION (Ocean Research Interactive Observatory Networks) are under rapid development. And, new free-floating buoy systems could be equipped with acoustic data loggers. All of these resources could be called upon in order to collect, in relatively short order, a representative sample of ambient noise profiles which could be used to flesh out current knowledge and implement a set of Ocean Noise Criteria such as has been sketched out here. As a bonus, these systems could also provide some monitoring capabilities that would collaborate assumptions made during the evaluation and permitting process—an important step often impractical or impossible under current and other proposed standards.</p> | | | | | | 33-16 |
| <p>With respect to functional hearing groups, we recommend that you specifically describe and discuss whether all mysticetes will be subject to the same acoustic criteria matrix to estimate take or whether, in cases where data are available to indicate that the functional group criteria are</p> | | | | | 35-6 | |

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| inappropriate (either set too high or too low) for a specific species, NMFS will apply modified criteria. We request that you particularly address what criterion will be used to determine Level B harassment takes in bowhead whales. | | | | | | |
| NMFS proposes to divide marine mammals into 5 functional hearing groups and defines those groups. The EIS should specify how sperm whales are classified. The <i>Federal Register</i> notice states that the mid-frequency cetacean functional hearing group will include “all odontocete species (dolphins and porpoises) not included in the low or high frequency groups”. The placing of the words (dolphins and porpoises) in parentheses after this statement, as if this is the group of odontocetes under consideration, is confusing. We assume that sperm whales will be placed in the mid-frequency cetacean group. However, we recommend specific statement of where sperm whales will be placed. | | | | | 35-7 | |
| With respect to estimating exposure, the estimate of the level of take of a marine mammal species or stock due to a proposed action that introduces sound into the marine environment requires some additional estimate of the level of sound received by individuals of that species or stock. However, the propagation characteristics of sound from a given source can be highly site specific. Sound propagation must be addressed in the EIS. We also request that you describe and discuss whether you foresee any new procedures or regulations to determine sound propagation if these new criteria are applied. | | | | | 35-8 | |
| With respect to Level B harassment take due to a sound that causes avoidance: the probability that the sound will actually cause avoidance may, in at least some situations and some species, vary among types of individuals and may vary depending on context. However, as described in the current <i>Federal Register</i> Notice, it is unclear if the criteria with respect to Level B harassment in some of the alternatives is not blurring the distinction between predictions about the probability of take of the average individual within the population or stock and predictions about the level of take of individuals that are based on a range of probabilities of take. This needs to be clarified by NMFS to allow a more thorough consideration of the alternatives. | | | | | 35-11 | |
| We also recommend you explicitly define avoidance. How far must marine mammals avoid the sound to be categorized as doing so (e.g., 0.05, 0.5, 1, 5, 10 km, etc.)? | | | | | 35-13 | |
| We support NOAA’s efforts to establish acoustic impact criteria reflective of best available science, noting that there must be flexibility in applying the criteria, tailoring it as | | | | | 36-6 | |

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| necessary to fairly encompass the effects of a particular action. | | | | | | |
| One size does not fit all for sound sources. The grouping of species and the categorization of anthropogenic sound are good. Although this creates a rather complicated “matrix” of possible exposure thresholds, a subset would be needed for any particular action. We note that the definition of “impulsive sound” is not standardized and we encourage NOAA to restrain from narrowly defining impulsive sounds based on time duration alone (without regard to the number of waveform cycles, rise-time, or frequency bandwidth). The action proponent should be allowed to define (with justification) if the sounds of interest are impulsive-type or non-impulsive. | | | | | 36-7 | |
| Navy scientists agree that the best available science has established temporary threshold shift (TTS) as the appropriate impact threshold listed for marine mammals and the process outlined for estimating permanent threshold shift (PTS) from TTS data. Navy experts agree that the most reasonable choice of criteria for Level A harassment would be PTS. Navy experts agree that the most reasonable choice of criteria for Level B harassment would be TTS, and, as appropriate, to address potential long-term sub-TTS biologically significant effects, a level 5 dB lower than TTS. The extrapolation from marine mammal species for which there is knowledge of exposure effects to those for which there is not, and the extrapolation from terrestrial mammals when no information exists for the class of mammals considered, are standard approaches used by the scientific community. Such extrapolation is consistent with the best available science. | | | | | 36-8 | |
| There are many and diverse types of man-made noise. It is too limiting to put them into two general categories of impulse and non-impulse. There is no mention of bandwidth of the signal. There is no distinction between the properties of a signal at the source from the signal at range (i.e., at the receiver). There is no distinction made between different sound sources (e.g., sonar, seismic, explosive, etc.). | | | | | 36-9 | |
| I do want to restate that crafting an ONC is a responsible policy objective, but I feel that care must be taken to create a working document that will be easily modified as more becomes known about marine bio-acoustic adaptations. I believe that we will find this flexibility an important precaution for both the conservation interests as well as the military, civil and industrial generators of ocean noise. This is largely due to the one premise that all interests seem to agree on; that we know very little about how animals | | | 37-1 | | | |

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| receive, perceive and use sound in the ocean. | | | | | | |
| <p>Our lack of knowledge has driven the strategies of both “camps.” The conservationists’ call to apply the “precautionary principal” regarding the safety of marine life sometimes seems to fly in the face of some of the biological evidence that the “ocean resource stakeholders” witness while out at sea. As a result, the ocean resource stakeholders tend to discount many of the conservationists concerns. There is an apparent opacity between these increasingly disparate points of view. Unfortunately, if we craft “hard won” noise thresholds based on the current state of our knowledge, we are likely to find ourselves boxed into inappropriate corners once we find out more about bio-acoustic adaptations that we currently know nothing about, and in some cases, do not even possess the tools, the biological models or cognitive ability to evaluate.</p> <p>A clear illustration of this is contained in the very ONC proposal document. This document makes the example of how the proposed ONC would be applied in the context of gray whales. The document assumes that there are well known and clearly defined sound levels that would induce permanent or temporary threshold shifts (PTS and TTS) for gray whales. The fact is we actually have no scientific data on what these levels are for gray whales.</p> <p>If you examine the literature, we find that the assumptions made about gray whale hearing are based on the comparative physiology of the inner ears of gray whales (large mysticetes) against the inner ears of dolphins (small odontocetes) and of terrestrial mammals (chinchillas). These assumptions are further extrapolated from some observations of avoidance behavior of gray whales while migrating. From my perspective, these models fall short of responsible scientific inquiry. If there is an orthodox scientific avoidance of “anthropomorphizing” grey whales, there should probably be an equal avoidance of "chinchillapomorphizing" the whale as well.</p> | | | 37-2 | | | |
| <p>An important omission in the gray whale example is that the model exclusively accounts for the inner ear as acoustical receiver. It makes no accounting for any other sound perception pathways through the gray whale body, such as the lipid system in the animal’s rostrum. The assumptions also make no accounting for perceptual non-linearities across the frequency bands and amplitudes (called “recruitment” in humans).</p> | | | 37-3 | | | |
| <p>The reach of these assumptions throw into question the scientific foundations of the proposed levels and how they</p> | | | 37-4 | | | |

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| <p>are to be applied. This also points out another biological shortcoming of the proposed ONC; they are focused almost exclusively on marine mammals. While there are clear legislative reasons for this focus, the assumption seems to be that marine mammals are more adversely affected by noise, and that the other animals in the sea are somehow less sensitive or less susceptible to the adverse affects anthropogenic noise.</p> | | | | | | |
| <p>The dearth of bio-acoustic information on other marine animals – both vertebrates and invertebrates – is a clear liability in how we establish appropriate noise criteria. Of the estimated 25,000 species of marine vertebrates, we have hearing data on less than 100 animals. These data are based on studies of animal sound perception that are dependent on some fairly blunt tools. By-and-large, bio-acoustic research is limited to only a few accepted scientific methods; evaluating trained behavioral studies in captive settings, examining laboratory induced brainstem electrical responses to acoustical stimulus (ABR), or observing animal responses to acoustical stimulus in their own habitat. While these methods are really all we have, there are obvious drawbacks to each of them. Perhaps the most significant drawback is that our auditory tests on non-mammalian biota are based on the perceptual priorities of mammals. The most apparent example of this is that mammals seem to have a priority for pitch discrimination that may not play into other animal’s sound perception. This is represented in the presence of the spiral-formed cochlea in mammals that is not found in any other vertebrates. The cochlea is especially not found in marine invertebrates.</p> | | | 37-5 | | | |
| <p>There are other qualities of sound that we should also include in an ONC that have heretofore been ignored. Dr. Mardi Hastings of the Office of Naval Research has proposed the used of a “Noise Exposure Level” that partially addresses this concern, but I believe that there are other aspects of the time domain issue that need to be integrated into the ONC model. This is becoming increasingly evident in the last five years of whale and dolphin strandings. The dramatic rise in these strandings are coincident with the increased use of mid frequency marine digital communications (particularly by the military). These signals are fairly loud, though not necessarily any louder than older “analog” sonar technologies. It is quite possible that these digital signals are presenting extreme time domain information that animals are not biologically adapted to – or are even damaged by in dimensions that we humans do not understand. This may account for the dramatic rise in animal mortality coincident with these new</p> | | | 37-7 | | | |

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| signals. | | | | | | |
| These concerns are framed in the context of marine vertebrates, but marine invertebrates – from mollusks to cnidara – are also biologically adapted to perceive acoustical energy. While the “value” of any invertebrate may not compel us to abandon our ocean enterprises, their biological roles in the marine ecosystem are no less important than the role of the great whales. In many cases, the one does not live without the other. While the study of marine invertebrate sound perception has largely evaded the curiosity of researchers, slowly we are finding that these animals also depend on adaptations to sound – which we are quite possibly disturbing with our noise. | | | 37-8 | | | |
| By these arguments I am not advocating that we abandon the Ocean Noise Criteria proposal, rather I am suggesting that we open up the noise criteria process to include or make way for sound qualities that affect a broad range of marine biota, not just cetaceans. I am also proposing that these criteria are crafted on sound scientific studies of the biota (in their habitat where possible), rather than basing them on models assembled from convenient assumptions. | | | 37-9 | | | |
| Because the criteria chosen will be applied in all waters for which NMFS issues permits, this decision will affect the resources and values of many marine protected areas and preserves, including the twelve National Marine Sanctuaries. NMFS must consider these effects. See 40 C.F.R. 1508.8. Noise pollution is an increasing problem in the Sanctuaries and has been singled out by at least one Sanctuary Advisory Council for action. It is our strong view that NMFS should consider, as part of the EIS, at least one set of criteria that would treat more conservatively all noise-producing activities with potential impacts on resources of marine protected areas such as the National Marine Sanctuaries. | | 38-10 | | | | |
| Suggestions for improving the substance of the criteria under consideration include (a) accounting for all behavioral and physical impacts, not just auditory ones; (b) accounting for indirect and longer-term effects; (c) making, wherever possible, more fine distinctions between marine mammal species (whereas all whales are now grouped into two categories); (d) treating more conservatively all noise-producing activities with potential impacts on resources of marine protected areas, such as the National Marine Sanctuaries; (e) treating more conservatively noise that may impact particularly sensitive receptors (such as mother-calf pairs or migrating whales); and (f) addressing cumulative and synergistic impacts. | | 38-13 | | | | |
| We suggest that NMFS disclose, in its EIS, any | | 38- | | | | |

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| <p>extrapolations from species to species upon which it relies in crafting and choosing its criteria, and that it explicitly evaluate the difficulties of such extrapolations. It is potentially problematic, for example, to rely (as it appears you do) on data from humans, other land mammals, and noise-habituated, captive marine mammals when determining levels of auditory impacts on marine mammals throughout the oceans, especially those that are less likely habituated to sound than the sample populations relied upon for baseline data. The EIS must carefully justify reliance on extrapolations of this type and would be greatly improved by the addition of an alternative that minimized such extrapolations.</p> | | 14 | | | | |
| <p>If NMFS goes forward with its proposal, it will be necessary to create a separate category of threshold criteria for BCBC bowheads; any change to the current behavior-based criteria for determining “take by harassment” during the bowhead migration would undermine NMFS ability to do this.</p> | | | 40-3 | | | |
| <p>At the Seattle Scoping Meeting, NMFS responded to a question with the statement that explosives would be treated differently from the way that other sources (including impulses) were treated. This is not mentioned in the NOI.</p> | 41-6 | | | | | |
| <p>As discussed at the Silver Spring scoping meeting, NMFS-HQ has had a long-term (at least 3 year) quest to establish criteria and acoustic thresholds for impact of sound on marine life. The NMFS ‘Criteria Panel’ briefed its results at an MMC meeting in April 2004, and showed that the work is progressing, but is not finished. For example, there were no thresholds at all for Level B behavioral harassment for any types of sound.</p> | 41-8 | | | | | |
| <p>The premises for the proposed criteria and status quo are without basis. The criteria listed in the announcement make no sense and most cannot be justified. The 120 dBrms harassment threshold for the ‘status quo’ for ‘continuous’ sources has no precedent that we know of (except perhaps the 0% impact level for the long and unique LFA and NPAL signals). By naming 120 dBrms as the ‘status quo,’ NMFS has biased the EIS decision process so much as to make it invalid. If the ‘status quo’ is stated as the ‘no-action’ alternative, then the ‘status quo’ will be argued by many to be the ‘status quo’ for the future. This has no basis in reality and is challenged here. The only remedy that would be fair and consistent with existing ‘science’ is to retract the NOI and state that the ‘status quo’ was incorrect as given in the NOI.</p> | 41-12 | | | | | |
| <p>There are very important legal implications here. It is apparent that NMFS has not considered the impact of its NOI - since even the lowest-power sound projectors are</p> | 41-13 | | | | | |

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| likely to require permits under the ‘status quo.’ A majority of NMFS’ Final Rules and Section 7 Consultations documented over the past seven years are found to be inconsistent with the ‘status quo,’ and it is certain that some will say they should be revised. Suits can be based on the NMFS statements. For example, to even suggest that if an animal can hear sound under high sea state conditions it will be injured is irresponsible. | | | | | | |
| The proposed classification of sound sources (pulse and continuous) has no connection to ‘science,’ and many signals at range will fit into none of the four classes. | 41-14 | | | | | |
| The proposed use of an energy metric has little basis - especially for projector signals. There are no TTS data for typical sonar pings. The extrapolations from very long duration exposures to short ones, from octave bands to tones, from unmasked to masked are strictly hypothetical and have no empirical support. Even the application of in-air data misrepresents the science at hand. | 41-15 | | | | | |
| For ‘impulses,’ what constitutes fast rise times and what metric is sensitive to rise time (none mentioned)? Rise time and impact on marine life have not been shown to be correlated, nor have peak pressure and impact. We do not see any acknowledgement that positive impulse has been favored by many as the best predictor of impact of explosives in water. It is the precedent for level A for ship shock. | 41-16 | | | | | |
| The proposition for use of TTS and PTS (plus or minus some number of dB) as the main criteria for Level B and Level A harassment is precedent-setting in itself. Except for ship shock tests, we know of no example of the use of TTS for Level B. We have no examples of the use of PTS for Level A (although 50% eardrum rupture is said to correlate with 30% PTS for cetaceans in the ship shock EISs). The premises on which auditory impact criteria are built are weak and ill-defined. | 41-17 | | | | | |
| What data and expertise will NMFS call upon to develop the EIS? Just as for the NMFS ‘Criteria’ Panel, it seems that NMFS would have to rely on experts and measurement sets funded primarily by DOD and MMS. In other words, the development of the new criteria and thresholds will strongly depend on the cooperation of the agencies that NMFS spends much of its resources regulating. We suggest that this alone is a potentially fatal flaw in the approach. | 41-19 | | | | | |
| As introduced to the public for the first time in the April 2004 briefings of the NMFS ‘criteria’ Panel to the MMC, the Panel has proposed to put each of the many and diverse types of man-made noise into two classes – impulse and non-impulse. We presume that ‘continuous’ in the NOI | 41-22 | | | | | |

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| <p>replaces 'non-impulse.'</p> <p>We argue that the approach that allows the 'best science' to be applied is that which treats each source type and scenario on a case basis. After all, there are not very many sources/scenarios that have possible impact on marine life, and hence no real advantage to trying to force sources/scenarios into two classes.</p> <p>Why do we recommend that scenarios be treated on a case basis? The properties of the sound field at ranges of possible impact differ widely from one case to the next. For example, the sound field generated by a small shot at harassment range is vastly different from that of a large shot, with increasing differences dependent on water depth, multipath, etc. The signal at range in shallow water for a large shot better fits the 'non-impulse' category than the impulse category. A short, tactical sonar pulse does not have a fast rise time, is of small bandwidth, and does not at all fit into the NMFS' defined 'impulse' category (as was stated at the Seattle scoping meeting.).</p> <p>The architects of the classification approach (according to the scoping meetings, the classification approach comes from the NMFS Panel) do not, it seems, recognize the properties of a signal at range. What is the rise time of a 30 ms sonar ping at 2 km? What is the duration of the sound from a 500-kg explosive in typical shallow waters of the US East coast at 60 km? In what class goes the off-the-shelf sonar system with a 0.02 second pulse length and a 10 Hz repetition rate, at range?</p> <p>There is no mention of bandwidth of the signal. This is a key factor in the detectability of a signal, not to mention the impact on animal hearing bands, etc.</p> <p>NMFS has been very consistent and rational over the past six and more years in making formal distinctions:</p> <ul style="list-style-type: none"> ▪ between single explosives and multiple explosives (different Level B harassment criteria), ▪ between short-term sonar transmissions and long-term transmissions in one area, ▪ among airgun sources and other 'impulsive' sources, such as explosives, pile drivers, sonic booms, and even short sonar pulses, ▪ among very low-frequency projector transmissions, low-frequency projector transmissions, mid-frequency | | | | | | |

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| <p>projector transmissions, and very high-frequency projector transmissions.</p> <p>None of this is even mentioned in the NOI, and cannot be accounted for in the animal classification scheme. Most importantly, the ‘status quo’ statement in the NOI is completely contradictory to what has been found in formal NMFS decisions (as stated in Final Rules, Section 7 Consultations, and written opinions) over the past six years.</p> | | | | | | |
| <p>NMFS has published a recent view of the criteria and thresholds best supported by ‘science’ in an internet-available briefing (given in April 2004 at the MMC ‘Second Plenary Session’). The findings are not at all consistent with precedent (based on recent permits) nor is there any connection to the ‘status quo’ of the subject NOI. Further, the Panel findings have not been subjected to a formal public review and response process (we, for example, can agree with almost none of the findings as anything but hypotheses.).</p> <p>According to NMFS at the Seattle scoping meeting, the Panel will publish its findings in the Journal of the Acoustical Society of America. Has the paper been submitted for publication? Under what topic (e.g., bioacoustics, underwater acoustics, psychological acoustics)? It is usually the case that the time from submission of a paper to publication is at least one year. Will the paper that was submitted be made available to the public - so that the public can see what the NMFS Panel recommends for criteria and thresholds? If not, the NMFS EIS process will not be at all influenced by the formal NMFS recommendations to be published. Are all Panel members listed as authors of the paper? Is there consensus on the part of the Panel members for all of the contents of the paper?</p> | 41-23 | | | | | |
| <p><u>Has NMFS Made Estimates of the Likely Impact of the EIS?</u></p> <p>For example, what if the ‘status quo,’ as specified in the NOI, were retained as the ‘no action’ alternative? Does NMFS understand that very few sound sources in the ocean would not need permits under MMPA? Depending on the definition of ‘dBrms’ (a large issue by itself), merchant ships, fish finders, bottom profilers, recreational vehicles, small explosives, most projectors, most sonars, etc. would need ‘take’ permits. Existing permits would likely be challenged, and new permits requested under the ‘status quo’ guidelines.</p> | 41-31 | | | | | |
| <p><u>What Is the Source for the ‘Status Quo’ Thresholds?</u></p> | 41- | | | | | |

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| <p>A dominant issue for the NOI is the definition in the NOI for the ‘status quo’ for impact thresholds for effects of man-made noise on marine life (actually limited in the NOI to marine mammals, and then only to cetaceans and pinnipeds) (see Table 1 on page 1873).</p> <p>Consider on page 1873 of the NOI:
“Alternative 1: A no action alternative would perpetuate the use of the existing thresholds for Level A harassment and Level B harassment ... that have been used for the past six years.”</p> <p>From Table 1, the ‘status quo’ is listed as: 180 dBrms for Level A, and 160 dBrms for Level B for ‘impulse’ noise and 120 dBrms for Level B for ‘continuous’ noise.</p> <p>In response to a question at the Seattle meeting, Dr. Gentry said that NMFS has allowed no exceptions to the ‘status quo,’ although he also said explosive sources are treated differently (such special treatment for explosives is not mentioned anywhere in the NOI).</p> <p>In response to another question, NMFS said that a sonar ping could fall into either class (impulse or continuous) depending on the pulse length of the ping. This is contrary to precedent and to available science.</p> | 32 | | | | | |
| <p><u>Where Do We Find the Definition and Precedent for ‘dBrms?’</u></p> <p>The NOI states that it intends to cover all man-made sound sources (including in-air sources for pinnipeds in air). On the other hand, the ‘status quo’ threshold metric is listed as ‘dBrms.’ This metric is in common use for airgun signals in water, but is almost never used for any other types of noise in water. Instead, SPL, intensity level, peak pressure level, energy flux density level, energy flux density band level, SEL, and positive impulse are the kinds of metrics in current use in formal compliance documents.</p> <p>‘dBrms’ is not well-defined for HESS applications, and is not generally the same as SPL (nearly always used for projector signals). For example, ‘peak SPL’ is not an unusual metric for explosives. But ‘peak rms pressure’ makes no sense. [Problems with rms pressure are well demonstrated in the recent Tolstoy et al. (2004) paper on airgun noise from the <i>Ewing</i> - in which the HESS metric and the practical measurement of rms-pressure level seem greatly (perhaps 10 dB or more) at odds.]</p> | 41-33 | | | | | |
| <p>120-dBrms as an Impact Threshold for ‘Continuous’ Noise</p> | 41- | | | | | |

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| <p>Note first that the average ambient noise level in the western Mediterranean Sea (among other ocean regions) is often above the 120-dBrms threshold for ‘continuous’ noise. [That there is a thriving population of cetaceans in that area (including mysticetes) could be noted, but it is in fact not really very relevant.] Thus the threshold is, at least in some ocean regions, below ambient. Except in special cases, it is unlikely that a marine mammal could detect a 120-dB signal in a 120-dB ambient field.</p> <p>As for the 120 dBrms threshold being the ‘status quo’ for the past six years, we note that there are a number of ‘vetted’ permits and/or NMFS-reviewed ESA consultations from the past several years that apply much different thresholds.</p> <p>Consider also the recent permits for the very special cases of low-frequency projector sources. For both SURTASS-LFA and NPAL, the metrics and thresholds have no resemblance to the metrics and thresholds of the ‘status quo’ of Table 1.</p> | 34 | | | | | |
| <p><u>Impact Thresholds for Airgun and Explosive Noise (‘Impulse’ Noise in some cases)</u>
The NOI does not say that explosives are not included - and explosive precedents give a number of counter-examples to the NOI claim of the ‘status quo.’</p> <p>In addition, airgun-survey precedents are well established, and many permits have been issued in the past six years. The ‘standard’ ‘HESS’ thresholds are not exactly the same as the thresholds in the NOI, but at least related. (There is a higher Level A harassment threshold for pinnipeds, at 190 dBrms). Moreover, it is very important to understand that the ensonified areas and waveforms and repetition rates for airgun surveys are unlike those for any other sound sources. The impact criteria and thresholds established by HESS are intended for use only for ‘typical’ airgun surveys. They have not, as a rule, been applied to signals from explosions or sonars or pile drivers or sonic booms (in water).</p> | 41-35 | | | | | |
| <p><u>Examples of Use of 120 dBrms Threshold for NMFS-Reviewed Compliance Actions in the Past Six Years (for ‘Continuous’ Sources) ?</u>
We were unable to find any examples of the use of the 120 dBrms threshold (but there are many examples in which a different threshold was used.)</p> | 41-36 | | | | | |
| <p><u>New Research Results Since Six Years Ago?</u>
As is very evident in the April 2004 briefings of the NMFS ‘criteria’ Panel to the MMC, there is very little, if any, new</p> | 41-37 | | | | | |

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| (i.e., in the past six years) empirical data to justify new (or old) criteria and thresholds for key sound sources (sonars, airguns, explosives). This is not to say that there has not been much valuable research conducted (a majority under DOD and MMS funding) on the impacts of sound on marine life. | | | | | | |
| Will explosives be treated in EIS or not? If yes, what happens to all of the precedent established over the last 10 years? Is an explosive pressure wave at range an 'impulse' or a 'continuous' signal? How is dBrms estimated? What about explosive simulator signals, water-gun signals at range, etc.? | 41-38 | | | | | |
| NOAA Fisheries should analyze how the acoustic criteria could be applied in a geographic or spatial context. This concept is not without precedence for NOAA Fisheries. In the final rule for SURTASS LFA Sonar (50 CFR § 216.184), NOAA Fisheries established several "offshore areas of biological importance for marine mammals" where received levels were required to be below the minimum threshold (180 decibels). Some of these areas were only seasonal; others were in place throughout the year. Any regulations resulting from this action should similarly require lower exposures levels for sensitive areas of the marine environment. For example, areas of known breeding and feeding for marine mammals may be appropriate places for very conservative criteria. Marine protected areas may also be appropriate places to apply more conservative criteria. | 42-2 | | | | | |
| NOAA Fisheries should incorporate a spatial component into its range of alternatives. One option to do this may be to include "spatial sub-alternatives" to each alternative currently identified in the notice of intent. The current list of alternatives only considers different ranges of received levels of a sound, while not considering other variables such as geography. For example, within each range of received levels, NOAA Fisheries could include an alternative that would apply those criteria with no geographic restrictions (as it is currently listed now), and an alternative that would apply those criteria in manner that would be highly conservative for certain sensitive areas of the marine environment. | 42-3 | | | | | |
| NMFS' goal in setting acoustic criteria should be to set criteria such that noise below the lower threshold will not result in any takes, noise between the thresholds will result in Level B takes only, and noise above the higher threshold will result in Level A takes. | | | | | | 43-1 |
| Some of the proposed criteria go further than this, redefining what constitutes a take, apparently without | | | | | | 43-2 |

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| <p>regard to whether the definition is consistent with the law. As a result, it will be questionable whether the proposed alternatives can be implemented. For example, Alternative III uses the 50% behavioral avoidance level as the criterion, implying that if only 49% behavioral avoidance occurs, Level B harassment would not occur. This appears to contradict the act, which refers to "a [single?] marine mammal." Alternative VI refers to PTS onset + 6 DB as the threshold, implying that some levels above those required to cause PTS would not require a Level A permit. This redefines injury to the auditory system as not an injury. Again, this appears to contradict the letter and spirit of the act. Further, the EIS should address whether the different definitions in the MMPA and the National Defense bill merit different criteria.</p> | | | | | | |
| <p>The establishment of functional hearing groups is a step in the right direction. Presumably, the number of groups will increase as knowledge improves. In addition to the physiological hearing capabilities, groups ought to be delineated on the basis of behavioral responsiveness to noise. For example, Dall's and harbor porpoises likely have similar hearing capabilities, but their behavioral tolerance of noise is different. Similarly, hearing abilities of California and Northern Sea Lions are comparable, but their behavioral tolerance of noise is different. It will be important to expand the scope of the EIS to incorporate behavioral differences.</p> | | | | | | 43-4 |
| <p>The distinctions between single and multiple noise events, and pulse versus non-pulse noise are steps in the right direction. However, a third time frame may be worth considering in the EIS. Noise may cause short-term behavioral changes that pose little risk of immediate injury or death. However, the cumulative effect of days or weeks of modified behavior may become life threatening (e.g., if the behavior change is exclusion from a feeding ground). That is, a few minutes of exposure may only have potential for Level B effects, while weeks of exposure may have the potential for Level A effects.</p> | | | | | | 43-5 |
| <p>The validity of assumptions needs to be considered in the EIS. For example, the assumption that criteria are truly conservative needs to be considered. Statistically significant changes in killer whale behavior at estimated received levels of around 105 dBRMS re 1 uPa have been documented. This is lower than all the alternatives except Alternative II. There are no data regarding the hearing sensitivity of mysticetes, so the assumption that they are less sensitive than odontocetes is unsupported (it seems likely that many species have comparable sensitivity at low</p> | | | | | | 43-6 |

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| frequencies set by ambient noise, while absolute sensitivity may differ due to differences in ambient noise at the frequency of best sensitivity). The accuracy of cross-species extrapolations also needs to be assessed. In particular, temporal integration of noise varies widely across species, meaning more caution will be needed to extrapolate effects of continuous sounds than pulses. Also, continuous sounds can resonate, providing a mechanism for unexpectedly large consequences, and this needs to be considered. | | | | | | |
| Another factor that needs to be considered is geography. The risk of driving cetaceans ashore is obviously greater in near-shore waters than in the open ocean. The potential for diving diseases like the bends is higher in deep water than in shallow water. The risk of vessel collision during a period of threshold shift may increase more in a shipping lane than in a remote area. The risk of predation due to behavioral changes or threshold shifts is probably higher where predator density is higher. | | | | | | 43-7 |
| On behalf of the International Wildlife Coalition I thank you for the opportunity to provide comments regarding the scope of a issues discussed in an upcoming NMFS Draft Environmental Impact Statement (DEIS) analyzing the potential impacts of applying new criteria in guidelines to determine what constitutes a “take” of a marine mammal under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). While the International Wildlife Coalition (IWC) applauds efforts to further understand the impacts of noise on marine mammals, including the “biological significance” of noise impacts, we feel that the alternatives proposed in the EIS scope contain assumptions that exceed the current knowledge we have regarding marine mammals and noise. | | 44-1 | | | | |
| While there may be enough confirmed recordings of marine mammal vocalizations to accurately address the acoustic repertoire of many marine mammal species (and thus place them into functional hearing groups discussed), frequency range is not the only factor to consider when considering noise impacts on marine mammals. Duration and intensity of sound may also impact marine mammal behavioral and physiological response (Tyack, et al., 2004). Additionally, the acoustic criterion provided in Tables one and two of the Federal Register notice (F.R. Doc. 05-525) address only sound intensity, ranging from 120-221 dB _{rms} re: 1μPa, and not frequency ranges of noise, nor duration. There is no clear indication in the scoping presented here that these elements will be adequately addressed. | | 44-2 | | | | |
| The IWC also has concerns about assumptions regarding | | 44-3 | | | | |

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| <p>hearing and behavioral/physiological responses of marine mammals for which little research exists. The scoping document presented here states that “the criteria assume that all species in a function hearing group have the same threshold apply to all species in the group,” and that “in the absence of data for marine mammals, in some cases data from terrestrial mammals are used in determining exposure criteria.” This transference of knowledge is considered acceptable for injury, as “because the anatomy of the inner ear of all mammals is extremely similar.” First of all, the terrestrial mammal ear is quite different structurally from marine mammal ears. The outer ear in marine mammals contains no pinnae and sound is conducted to the ear via conduction along the bone. Furthermore, the maleus is not connected to the tympanic membrane, but is attached hard and fast to the bulla (Au, 1993). Additionally, a recent report by the National Research Council (2005) states that other, nonauditory effects of sound may impact animals, including rectified diffusion. Rectified diffusion is a physical phenomenon that leads to the growth of microscopic nuclei in the presence of high-intensity sound, and might be a possible mechanism of non-auditory acoustic trauma in human divers and marine mammals, leading to injury or death (NRC, 2005).</p> | | | | | | |
| <p>Other physiological impacts of noise on marine mammals occur besides TTS and PTS, including the impact of stress. Stress in marine mammals may be studied in a variety of ways, including the use of glucocorticoid and other serum hormone concentrations to assess stress. The IWC agrees with the NRC that further research into this area to develop validated, calibrated curves for these indicators of stress in marine mammals (NRC 2005).</p> | | 44-7 | | | | |
| <p>The scoping document presented here depicts only single-species criterion, while multiple species in various frequency ranges are very likely to be found in the same areas at the same time of year (i.e., grey whales and Pacific white-sided dolphins). Thus, these criterion, if adopted, should still be accompanied by careful observation, and pull from various databases regarding marine mammal distribution and abundance, including those being recommended by the NRC (Recommendation 3, 2005).</p> | | 44-8 | | | | |
| <p>What are the methods used to account for the constantly changing and regional differences of the ocean environment and its effect on noise characteristics?</p> | 46-5 | | | | | |
| <p>CRE has previously commented to NMFS on implementation of the DQA pre-dissemination review requirements with respect to acoustic effects on marine mammals. CRE’s previous comments and their attachments</p> | | 47-9 | | | | |

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| are incorporated by reference into these CRE comments on the acoustic criteria EIS scoping. | | | | | | |
| CRE is not aware of any evidence that anthropogenic sound has any biologically significant effect on marine mammal populations or stocks, and that is the relevant regulatory standard that the acoustic criteria should address and reflect. | | 47-12 | | | | |
| <p>Reviewed the NMFS report on Haro Strait incident. While the report does indicate that the noise of the USS Shoup was the “likely” cause of the Ocra’s “behavioral reactions,” according to the NMFS metrics, the noise did not cause any harm. I believe this reveals some short comings of the NMFS metrics and their associated assumptions on a few accounts.</p> <ol style="list-style-type: none"> 1. They are based on assessment of biological damage in terms of Temporary Threshold Shift (TTS) and Permanent Threshold Shift (PTS). While TTS and PTS are benchmarks that are continually used for policy decisions, I don’t believe that using them reflects a humane concern for the welfare of animals. 2. The metrics include “sound exposure level” (SEL) that incorporates noise exposure over time (in seconds). While this metric may more accurately represent the physics of the sound exposure, it does not accurately represent the biological effects of the exposure. 3. The noise is only considered “noise” and is not frames in terms of the type of noise it is. 4. The opinion expressed in the report indicates that there were no “long term biological effects” due to “masking” because it only occurred over a short duration of three hours. This statement seems to assume the rationalist position that the Ocras are merely communication devices with sound instrumentation designed for a specific long term biological purpose. <p>Unfortunately, it appears that the NMFS believes that this “scientifically substantiated” document has absolved the U.S. Navy of any wrong doing. I will not hold the Navy up to the NMFS standards on this incident, and will continue to maintain that this disaster was another case demonstrating that the U.S. Navy active sonar technologies, and the NMFS standards, need to be seriously reviewed.</p> | | | 50-1 | | | |
| Support of Lowering Noise Levels | | | | | | |
| NMFS should lower the allowable levels of ocean noise that affect marine mammals. | 2-1,
3-5,
6-1,
8-1, | | | | | |

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| | 10-1, 15-1, 17-1, 18-1, 23-1, | | | | | |
| It is time to ban harmful noise totally. I oppose the whole project in this proposal. This issue could be settled by simply banning all noise. The status quo is no noise and we should stay at that status. | 14-4 | | | | | |
| Our recommendations for noise levels are also based on the Precautionary Principle. A great deal about noise levels received by marine mammals and marine mammal reactions, including damaging and lethal levels of noise, is unknown. Most suppositions are based on tenuous data. It is therefore important that we set noise levels for marine mammals at conservatively low levels at this time. Only when solid research demonstrates that higher levels are not harmful should NMFS noise guidelines be updated to allow higher levels. | | 16-9 | | | | |
| The marine mammals of the world are washing up on beaches because we are destroying their sonar capabilities with high noise levels through naval procedures. Please do not allow an even higher raise in the noise level. | 19-1 | | | | | |
| Any human-made devices, including sonar, that cause the death of another species should not be used. | 20-1 | | | | | |
| I find it reprehensible that you would even consider RAISING the noise levels in the ocean, when it has already been proven that existing levels of decibels leave death and destruction in their wake. | 4-1 | | | | | |
| It would appear that NMFS intends to revise acceptable noise levels well above those that many leading scientists believe are rational. It would be unfortunate if NMFS draws up an EIS to justify this revision by unscientifically asserting that these levels don't cause detectable and significant harm to whales and other marine mammals.

There is abundant and growing evidence, as seen in the controversy over the Navy's attempts to implement LFA and many other instances of human-caused sonic disturbance in the ocean, that the behavior patterns and physical well-being of whales, other marine mammals and, indeed, fish are being impacted negatively by the din of anthropogenic ocean noise. | 7-1 | | | | | |
| I urge your agency to act in ways that will enhance the well being of countless animals who are defenseless in the face of human onslaught. | 11-1 | | | | | |
| Please take all steps to eliminate most human made noise such as LFA sonar to keep oceanic ecosystems and it's | 12-1 | | | | | |

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| animal inhabitants free from harm. | | | | | | |
| I want to let you know that loud noises are not good for the ocean system, especially sensitive creatures like whales and dolphins, and they should be limited or even eliminated, not increased. | 13-1 | | | | | |
| I am against tampering with the noise level laws. I understand that whales are beaching themselves with blood coming from them because of the noise problem we already have. It should be made stricter not more lacks. This administration is the enemy of everything that breathes, grows and lives. Their form of "morality" is a sick joke played out on the planet. | 22-1 | | | | | |
| I have just been informed that the National Marine Fisheries Services is contemplating raising the noise level allowed in ocean testing for the Navy and oil and gas companies looking for deposits. If whales are reacting and beaching themselves when the noise level is 138 dB, why would this organization consider raising it even this high. I understand that the level is going to be raised above the allowable, now too high, 180 dB. I would strongly recommend lowering the noise level allowed to 100 rather than killing more marine animals. | 24-1 | | | | | |
| I am against seismic, ordinance and sonar explorations that kill or injure marine mammals. | 26-1 | | | | | |
| Please do NOT raise the allowable ocean noise levels. Do not put our marine mammals in more danger than they are now. Studies have proven that increased sonar has a detrimental effect on whales and other marine mammals. They cannot speak to protect themselves. We must now allow increased harm to come to them. Humans only 'rent' the earth from future generations. We must respect and protect our environments. | 27-1 | | | | | |
| Data Gaps | | | | | | |
| NMMA is concerned that NMFS, by seeking to establish a new set of guidelines with an incomplete set of information, is merely replacing one set of generic guidelines with another. In any event, the effort seems forced and premature. The many assumptions and extrapolations the Agency has identified it will need to make are problematic. NMMA believes that the extreme variability in mammalian auditory thresholds undermines the reliability of such extrapolations, which may be inaccurate, imprecise, and often inappropriate for management. Our view is bolstered by the experts, who have observed that "researchers have generally investigated either very basic mechanisms of hearing or induced and explored human auditory system diseases and hearing failures through these test species. Ironically, because of this emphasis, remarkably little is | | | 32-15 | | | |

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| <p>known about natural, habitat, and species-specific aspects of hearing in most mammals.” Based on the Notice of Intent, this seems not to have changed. Although NMFS claims to be establishing guidelines “tailored to particular species groups and sound types,” its limited data set constrains its ability to do so. The lack of audiograms is just the tip of the audiometric iceberg. Current science has to offer only limited masked threshold information, and even less on critical bandwidths and directional hearing. The sample size in existing behavioral studies is extremely small and may not be representative of the species that was tested, much less an entire functional hearing group. Furthermore, most controlled audiometric evaluations have been conducted with pure tones and/or narrow band emissions and do not reflect many of the real world sounds of concern. While auditory brain stem ABR studies provide new data on more subjects and hopefully more species in the future, the estimates of hearing sensitivity derived from electro-physiological methods are not as accurate as estimates from behavioral procedures. More importantly, the vast audiometric data needed on absolute hearing, masked thresholds, critical bandwidths, directional hearing, and TTS for various noise and signal types and with various representative species in order for them to act as exemplars are not in hand or on the near horizon. NMFS has outlined in its notice some of the assumptions it will need to make during the development of its acoustic matrix of threshold levels, including:</p> <ol style="list-style-type: none"> 1. All species in a functional hearing group have the same threshold; 2. The relatively limited set of data is capable of covering cases of missing data, so that information about the auditory of sensibilities of dolphins will apply to “other cetaceans;” 3. Applying hearing data from mid-frequency mammals to low-and high-frequency mammals is appropriate; 4. Utilizing data from terrestrial mammals is appropriate; 5. Extrapolating permanent threshold shift (PTS) levels from a limited set of temporary threshold shift (TTS) data, since no data on PTS exist, is appropriate; and 6. Behavioral avoidance constitutes a biologically significant disturbance. <p>This long list of assumptions that NMFS is apparently willing to make is troubling from both a scientific and a regulatory perspective. The Agency’s willingness to apply data across functional hearing groups and even among mammals within the same species fails to account for well-</p> | | | | | | |

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| <p>known and well-documented variability in species' auditory characteristics. According to NRC, "the behavioral responses of marine mammals to acoustic stimuli vary widely, depending on the species, the context, the properties of the stimuli, and prior exposure of the animals. Moreover, marine mammals are an "extreme example" of habitat adaptations and adaptations in ear structure and hearing capacity. In other words, external factors affect hearing even within species. It is also known that marine mammals suffer hearing loss with age, and may be impacted by natural sounds as well. The new guidelines proposed by NMFS also fail to consider a wide array of variables, including demographics, habituation and prior experience with loud or sustained noise levels, resource availability, the health of individuals and other factors of individual variability, sound transmission characteristics, ambient noise levels, weather conditions, and others. These variables are extremely difficult—if not impossible—to address through broad-based criteria and guidelines.</p> | | | | | | |
| <p>NMMA is deeply concerned about the lack of audiograms on marine mammals available to regulators and other policymakers. Although there are 119 marine mammal species, audiograms are currently available only for 10 species of odontocetes and 11 species of pinnipeds. As has been noted, the subject sample size of these species within these investigations has been very small and, in many instances, inclusive of only a single individual. The result is that "direct behavioral or physiologic hearing data for nearly 80 percent of the genera and species of concern for coastal and open-ocean sound impacts do not exist." Even with the existing data garnered from available audiograms, it is clear that considerable variation in hearing range and sensitivity exists among marine mammals. Given that, NMMA is perplexed as to why NMFS thinks it appropriate to extrapolate data among and across different marine mammal species and even data from terrestrial mammals where none for marine mammals exists. Defining the audiometric capabilities (audiogram, masked threshold critical ratios, critical bands, directional hearing, TTS) of the functional groups is primary and essential to begin predicting zones of audibility, masking, potential hearing damage and biological disturbance. Defining the spectra and source levels of different sources and species-specific calls is also necessary for mapping areas of concern. Aside from these parameters to which we have repeatedly referred, the physical data on bathymetry, surface and bottom boundaries, acoustical transmission losses, and propagation are all vital parameters that change with location, time, and</p> | | | 32-16 | | | |

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| <p>environmental climatic conditions. The high variability of physical parameters, audiometric limits, and animal behavior make modeling untenable without meaningful data to input. In addition, science in the area of marine mammals and underwater acoustics seems to be stagnating, something which may only be exacerbated by the current effort to utilize the existing base of incomplete scientific data to draft new sound exposure threshold guidelines. The National Research Council has noted that critical issues about the effects of transient and long-term anthropogenic sound on individuals and populations “remain unanswered,” while indirect effects of sound on marine mammals are “largely uninvestigated.” Many of NRC’s calls for improved scientific research have gone unheeded. Should NMFS proceed with this effort, research may stagnate further out of a perceived lack of need. Since more science is needed, this unintended outcome would be unfortunate. NMFS should take every opportunity to actively encourage independent scientific inquiry in marine acoustic research.</p> | | | | | | |
| <p>NMMA appreciates NOAA’s desire to adopt new “science-based criteria” for establishing an acoustic take under MMPA. Clearly, the ecological impacts of anthropogenic ocean noise are an important management concern for federal regulators charged with protecting marine mammals. Nevertheless, it is NMMA’s view that the science is not yet capable of providing clear guidance to decision makers and is insufficient to aid in the development of good public policy. The Marine Mammal Commission (MMC), an independent advisory group established under MMPA, has elucidated the nature of this problem clearly: “Even if the science were more conclusive and available to decision makers, it might not solve the problem of determining what consequences are acceptable (or not), as a matter of public policy.”</p> | | | 32-26 | | | |
| <p>Indeed, the Marine Mammal Commission has acknowledged “available information is often insufficient to accurately assess how existing sound sources may be affecting, or how new sound sources may affect, marine mammals and other components of marine ecosystems. Uncertainty about the effects of various sound sources confounds management efforts to provide suitable levels of protection for marine mammals and marine ecosystems while avoiding unnecessary constraints on those activities that generate the sound.” It is precisely these unnecessary constraints NMMA seeks to avoid. To that end, should NMFS continue to pursue this path, it should make it clear that it is not the intention of these guidelines to be used in the development of broad, far-sweeping closures to access</p> | | | 32-28 | | | |

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| to our nation's aquatic resources. Such a regulatory outcome would be ill advised considering the extreme variability with respect to the potential impacts sound may or may not have on marine mammals in their specific habitats. As has been noted previously, one of the only certainties existing research has been able to demonstrate is that any potential environmental impacts associated with anthropogenic noise are contingent on a wide array of contextual factors that do not seem to be sufficiently accounted for in the proposed alternatives. | | | | | | |
| NMMA strongly encourages NOAA to acknowledge that available science remains inadequate to justify the current endeavor. To be clear, NMMA supports additional research and scientific inquiry, and the association hopes the Agency elects to undertake such research rather than proceed prematurely with its current proposal. | | | 32-29 | | | |
| Masking: Likely occurring on the scale of tens of km to entire ocean basins. I want to take a little time to make the case for why it is important for NMFS to consider masking effects. I realize that there is little research to rely upon in several key areas: current ambient noise levels, the biological importance of masking, or directly measured Critical Bandwidths or Critical Ratios. Of course, the same could be said for the TTS/PTS approach; my contention is that masking is clearly a Level 2 harassment – it involves disruption of hearing signals that would otherwise be audible. (refer to commenter correspondence for example) | | | | | | 33-11 |
| It is also important to hold in mind the fact that many of the extreme human noises now being addressed are relatively new phenomena. Supertankers have become omnipresent in ocean ambient noise profile since the 1970s, when current generation was largely built; similarly, the repetitive pulse of airguns has been a feature only since the 1960s. While these time frames represent several generations for most marine creatures, this NMFS process to develop Ocean Noise Criteria offers the first opportunity to take a comprehensive look at these extreme noise sources. | | | | | | 33-12 |
| Regarding airgun activity, the very recent advances into deeper water areas are of special concern: it may be that airgun sound is now bouncing off continental slopes into Deep Sound Channel. The increasing use of repeat surveys (4D surveys) over productive areas is also adding to the concentration of airgun activity in key oil and gas development zones. Depending on seafloor profiles, both of these developments could be impacting large sections of ocean basins. | | | | | | 33-13 |
| In addition, the science surrounding the effects on the marine environment as a result of anthropogenic: sound in | | | 34-8 | | | |

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| <p>the oceans continues to evolve. Since the science in many marine areas is not fully developed, any evaluation of limited data may produce speculative findings. Industry encourages NMFS to set forth its findings through the EIS process in careful detail: separating assumption from fact, identifying assumptions, methods and extrapolations that underlie its conclusions, and avoiding conjecture. Industry recommends NMFS focus on the following overarching policy issues and legal principles in developing this EIS:</p> <ul style="list-style-type: none"> • The statutory standard for this EIS for authorizations under the MMPA is "best scientific evidence available." Congress did not intend agency findings to be based on speculation. • The EIS should present the science in an objective, transparent and unbiased manner, and clearly explain the underlying rationale for its conclusions. • The EIS must contain a full analysis of economic and social effects of the alternatives, including potential impacts on energy supply, as required by the National Environmental Policy Act (NEPA). • Under the MMPA, mitigation measures must be "practicable," based on the best science and account for the "economic and technological feasibility of implementation." • The purpose of MMPA is to protect marine mammals and to develop and carry out programs to support the continued existence of these mammals at their optimum sustainable population. • All sound sources-natural and anthropogenic-in the oceans should be analyzed and compared to one another relative to frequency, intensity and duration. • Statistical probabilities of marine mammals actually encountering significant anthropogenic noise should be considered and analyzed during the EIS process. | | | | | | |
| Indirect, Long-term and Cumulative Effects | | | | | | |
| <p>Are cumulative effects from the multitude of different noise sources (natural and anthropogenic) incorporated into NMFS decision making process? If so, how?</p> | | | | | | 25-17 |
| <p>The cumulative effect of effectively constant noise over very long periods must be addressed based on perceived reality, not the frequency of pulses per array over time.</p> | | | | | | 43-7 |
| <p>As marine science and the courts have increasingly recognized, intense underwater sound can have a range of deleterious effects on marine mammals and other ocean life-</p> | | 38-9 | | | | |

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| <p>some of which may be easy to overlook in an environmental analysis, because they are indirect or manifest themselves over the long term. An example of an indirect effect is the reduction in availability of prey species. Impacts to fish species from underwater sound are dramatic, and have been shown to include, among other things, greatly decreased catch rates among fisherman across large swaths of ocean. In Norway, for example, catch rates of cod and haddock fell dramatically (by 69 and 68 percent, respectively) in the shooting area of an airgun array and did not recover within five days after operations ended.' Fisherman saw a decrease of as much as 50% in cod and haddock catch rates within 6,000 square km around the noise. Such results could significantly impact foraging rates of marine mammals. A recent study suggests that giant squid, another prey species of some marine mammals, may also be injured and killed by ocean noise." Other indirect effects include the enhanced risk that animals affected by noise will succumb to ship-strikes or entanglements. Longer-term effects include the masking of baleen whale calls and the resulting reduction in animals' ability to communicate with each other and, potentially, to find mates.</p> | | | | | | |
| <p>The EIS must consider indirect and longer-term effects such as these for each proposed set of criteria evaluated-not simply the criteria's immediate, short-term impacts. This is especially true with respect to Alternatives IV through VI, none of which defines Level A or B harassment with any reference to behavioral, longer-term, or indirect impacts, as opposed to merely direct auditory ones. Scoping Notice at 1873-74. Indeed, the EIS would be greatly improved by the addition of another alternative that would consider acoustic criteria designed explicitly to account for such indirect and longer-term effects.</p> | | 38-9 | | | | |
| <p>In order to satisfy NEPA, an EIS must include a "full and fair discussion of significant environmental impacts." 40 C.F.R. 1502.1. This discussion must take account of the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future significant actions." 1508.7. A thorough cumulative impacts analysis is especially important to understanding the harm that may be caused by undersea noise. In reporting that there is "now compelling evidence implicating anthropogenic sound as a potential threat to marine mammals" at both the "regional and ocean scale levels," one of the most prominent scientific bodies studying the status of whale populations worldwide, the Scientific Committee of the International Whaling Commission, has recently stressed the significance of</p> | | 38-11 | | | | |

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| cumulative effects from acoustic activities. International Whaling Commission, Report of the Scientific Committee to the International Whaling Commission, at Annex K 5 6.4 (2004). The Committee found that evidence of increased sound from several different sources, including military sonar, ships and seismic activities, was "cause for serious concern." 12.2.5.1. The Committee also noted "the potential for cumulative or synergistic effects of sounds . . . with non-acoustic anthropogenic stressor. | | | | | | |
| Further research will show many marine species, including commercially important species of fin fish and shrimp, are more susceptible to noise damage than marine mammals. As noted by the reports of the National Research Council on ocean noise and marine mammals, because other marine species are part of the food chain for marine mammals, the susceptibility of these species to ocean noise also has direct and indirect effect on marine mammals. | | 16-8 | | | | |
| The focus of the noise exposure criteria seems to be nearly exclusively on PTS and TTS. While direct auditory damage is probably the easiest impact to model, it represents a tiny fraction of the likely total impacts on the organisms and the environment. Behavioral impacts which can affect the long-term health of populations seem to be given short shrift. There appears to be little acknowledgment of the possibility that modest exposure to noise could have negative population consequences, despite evidence from several scientific studies of noise on fish (e.g. Lagardere 1982, Scholik and Yan 2002, Smith et al. 2004). There is also absolutely no treatment of non-auditory effects as have been proposed for beaked whales and other deep divers. What is the rationale for entirely ignoring this potentially important phenomenon? | | | | | | 28-3 |
| It is disturbing that effects on the ecosystem seem to be ignored under these acoustic exposure criteria. The marine ecosystem is poorly understood and complex. Nevertheless, impacts from noise that affect ecological processes could well be occurring and must be considered, as these could indirectly affect marine mammals. Moreover, cumulative and synergistic effects need to be taken into account if one is concerned with truly protecting the marine environment. Marine mammals face many stressors which may be exacerbated by noise. As such, Alternative II is the most appropriate option as it incorporates more precaution. | | | | | | 28-7 |
| The approach used to determine the new criteria disregards the long term effects of noise, does not account for noise damage to non-hearing organs, and does not take into account recent findings that suggest certain whales get the 'bends' and die as a result of rising too quickly in response | 3-3,
6-4,
8-4,
17-4,
18-4, | | | | | |

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| to noise levels just over background. | 19-4 | | | | | |
| It is of primary importance that consideration of impacts must go beyond those that are auditory. The notice does not recognize the recent international advances in thinking about the potential for serious negative impacts, from other physiological or behavioral responses to noise sources, or from those occurring over the long term, for those which we can not currently detect (for example, Evans et al. 2002; Jepson et al. 2002; Fernandez et al. 2003; Dolman and Potter, 2004). Non-auditory physiological impacts may include: physiological stress, neurosensory effects, effects on balance (vestibular response), tissue damage from acoustic resonance, gas bubble formation and/or growth in tissues and blood, and blast-trauma injury. | | 29-3 | | | | |
| We believe that the acoustic criteria should be used to ensure, to the greatest extent possible, the protection of cetaceans from harassment as well as direct physical harm. At the present time, there is very little data on any long term, subtle and potentially undetectable, or cumulative impacts of noise pollution and the acoustic criteria does not attempt to deal with these critical issues. | | | | | | 29-8 |
| Consideration of non-auditory impacts is crucial. Using TTS as an analogue for behavioral disruption is not sufficient. There is a need to consider both behavioral disruption in its own right (as clearly stated in the MMPA), and to consider other physiological, non-auditory effects. | | | | | | 33-4 |
| The effects of repeated behavioral disruption and chronic exposure to elevated noise levels are important to consider. In order to address these cumulative impacts, there will need to be some consideration of regional, local, and migratory populations experiencing repeated exposures over the course of months or years. | | | | | | 33-6 |
| Will there be an assessment of the long-term effects and non-hearing organ effects of anthropogenic noise on marine mammals and other marine creatures? | 46-3 | | | | | |
| Mitigation | | | | | | |
| At the moment there is very little effort focused on assessing the measures of mitigation that are currently imposed. Serious effort should be invested in monitoring the effectiveness of the management measures that are currently prescribed. This should be considered in context of the different species of cetaceans as well as varying surrounding environmental characteristics. | | 29-9 | | | | |
| We must acknowledge the limitations of what can be | | | | | | |

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| <p>achieved using on board mitigation as a management method. It will not be possible to detect all animals that are encountered. The probability of detection will also be reduced by a series of other factors, including: operating at night; searching in rougher sea states; the number of observers; and the equipment used for monitoring. Therefore wider management measures including spatial and temporal restrictions must be considered as an integral part in the development of an acoustic criteria.</p> <p>Significantly, in 2004, the IUCN-World Conservation Union adopted a resolution entitled Undersea Noise Pollution. It calls for urgent action by states to reduce the impacts of high-intensity naval sonar systems on beaked whales and other vulnerable species. It recognizes undersea noise as a form of pollution; calls on states to avoid the use of intense noise sources in the habitat of vulnerable species or where marine mammals and endangered species may be concentrated; and urges states to work through the United Nations Convention on the Law of the Sea to develop mechanisms for the control of this emergent problem. It is critical that seasonal and geographical restrictions should be imposed during biologically important periods, and for vulnerable species.</p> | | | | | | |
| Marine Mammal Protection Act Compliance | | | | | | |
| <p>NMFS should address the specific issue of the Marine Mammal Protection Act's definition of harassment. Too often noise criteria and mitigation by NMFS has focused on issues of acute noise damage to marine mammals rather than protecting marine mammals from harassment due to underwater noise.</p> | | 16-11 | | | | |
| <p>In addition, the definitions of harassment in the MMPA have resulted in much confusion for both regulatory agencies and the regulated community. The lack of clarity surrounding the statutory definitions of harassment means that potentially any activity by recreational boaters and anglers could be construed as harassment. Within the context of recreational boating and boat engine noise, this lack of clarity becomes more acute, particularly in light of some of the alternatives proposed by NMFS in its Notice of Intent. Preparing more specific guidelines which operate under the current definitions does not correct the fundamental lack of clarity in the MMPA. In 2000, the National Research Council determined that the intent of the MMPA was never to regulate activities that result in minor behavioral changes, but rather activities which cause "meaningful disruptions to biologically significant activities," and made recommendations to clarify the</p> | | | 32-27 | | | |

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| <p>MMPA to that end. The U.S. Commission on Ocean Policy has endorsed this recommendation. Currently, however, the MMPA remains vague and subject to considerable interpretation. The U.S. Ocean Commission was forthright in its assessment of the current challenges with MMPA, noting, “NOAA and USFWS have had difficulties implementing the 1994 definition, which has led to public uncertainty with respect to its implications. The lack of clarity means that almost any commercial, recreational, or scientific activity that is noticed by a marine mammal might be defined as harassment. Both agencies assert that the confusion limits their ability to regulate even potentially harmful activities.” Given this, the current effort by NOAA to establish new sound exposure level criteria, which could result in greater restrictions on human activities in the marine environment, is of some concern. NMMA supports a well-reasoned effort to provide more clarity and certainty on what constitutes harassment. At the present time, however, such action is premature given the lack of reliable and fully developed scientific knowledge capable of providing adequate justification for any specific regulatory threshold, which will compound, rather than correct, the fundamental lack of clarity inherent in the law.</p> | | | | | | |
| <p>The definitions of “take” vary under the ESA and MMPA. NMFS must clarify how the guidelines can equally satisfy the multiple definitions. In addition NMFS must address the definition of harass according to the ESA.</p> | | | | | 35-4 | |
| <p>Scientific Advisory Committee</p> | | | | | | |
| <p>NMFS should provide the names, affiliations and research funding support sources (including NMFS and the US Navy) for the scientific advisory committee, and how the committee will interact with NMFS to provide the noise criteria.</p> | | 16-4 | | | | |
| <p>What is the relationship between the NMFS process and the current review of noise criteria being conducted by the Marine Mammal Commission Advisory Committee, and will the NMFS process incorporate recommendations from the MMC Advisory Committee?</p> | | 16-5 | | | | |
| <p>Unfortunately, the composition of the Acoustic Exposure Criteria panel of experts included no beaked whale specialist. Representation on the panel did not reflect the diversity of viewpoints in the scientific community. In addition, the Acoustic Exposure Criteria process suffered from a lack of transparency. Despite the relevance to many members of the public, there was no public oversight and as such, the outcome is likely to be viewed with skepticism and suspicion. For instance, a simple request for a listing of funding sources of panel scientists, made by a member of</p> | | | | | | 28-10 |

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| <p>the Advisory Committee on Acoustic Impacts on Marine Mammals in April 2004, has been only partially fulfilled. Such accountability appears to be standard among the Scientific Advisory Boards of the EPA, where panel members are diligently screened for conflicts of interest (e.g. Anderson 2003). In contrast, the Acoustic Exposure Criteria panel is vulnerable to charges of conflict-of-interest, as major noise producers, such as the U.S. Navy, have heavily funded panel members' research and one panel member is employed by the U.S. Navy. The Advisory Committee member's above request for a listing of funding sources resulted in a highly defensive reply by the director of the NMFS Acoustic Program.</p> | | | | | | |
| <p>WDCS would like to support the development of a set of Acoustic Criteria that is more firmly based in science. However, we are concerned that the 'expert panel' is not representative of all interests and the work that has been conducted on the Acoustic Criteria to date has been conducted behind closed doors. WDCS were first made aware of the expert panel at the Advisory Committee on the Impacts of Noise on Marine Mammals, of which WDCS is a member.</p> | | 29-2 | | | | |
| <p>The use of criteria proposed by the Noise Group, even in the guise of "just providing information", is questionable because the legitimacy of the Noise Group is also questionable. In all respects it represents an "advisory committee" as defined in Federal Advisory Committee Act (Pub. L. 92-463, Sec. 1, Oct. 6, 1972, 86 Stat. 770) as "any committee, board, commission, council, conference, panel, task force or similar group, or any subcommittee or other subgroup thereof, which is (C) established or utilized by one or more agencies." The Noise Group must therefore follow the rules as laid down by that Act, Section 2 of which specifically states that "the Congress and the public should be kept informed with respect to the number, purpose, membership, activities, and cost of advisory committees." The Noise Group has met none of these requirements and their offerings therefore cannot legitimately be used in any way in the formation of policy. Similarly, adherence to the US government's own guidance documents appears to be currently lacking with respect to the Noise Group and should be incorporated as part of the EIS process. For example, the Office of Management and Budget's "Final Information Quality Bulletin for Peer Review" of December 2004 that comes into force in June 2005, calls for the use of peer review by "qualified specialists" prior to the dissemination of "important scientific information" by the federal government. Further, the Bulletin calls for a</p> | | 30-10 | | | | |

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| transparent process and specifically calls out expertise, balance, independence and conflict of interest as important issues to address when selecting reviewers. | | | | | | |
| <p>The credibility of the Noise Exposure Criteria Group (NEC), conveyed by NMFS to provide guidance and expertise to create “tailored” exposure criteria, has been questioned by CSI and many others. Repeated efforts seeking transparency from the NEC have been ignored. Whether or not NMFS chooses to use any of the NEC findings, the assumption that a bias exists in the panel should be addressed with candid disclosure, not denial and avoidance.</p> <p>The assumption of bias in the process derives from the NEC’s composition, with some professionals who, in general, do not reflect the legally required balance of an advisory committee, may have potential conflicts of interest with funding sources and employment, and may not have demonstrated sufficient precautionary concerns about the issues at stake. The NEC also lacks transparency with panel procedures, discussions and findings. Other NGOs have provided specific concerns regarding the requirements of the Federal Advisory Committee Act (FACA) as it applies to the NEC, but we prefer a non-legal approach based on logic and communication: Please step back and consider your options for addressing these concerns, rather than dismissing them.</p> <p>The NEC’s makeup is almost unavoidable; we assume that NMFS sought the best advice possible, and did not attempt to “stack the deck” in creating the NEC, but is obvious that ONR and industry funding have been the primary sources for most marine mammal noise work for more than a decade. It is difficult to find professionals without the appearance of a conflict of interest, so it should not be taken as a slight on anyone’s professional integrity to recognize that it is the appearance of impropriety that needs to be addressed. Therefore, please comply with the many requests for information of NEC members, but emphasize the professionals who were asked to participate that have no such funding complications, whether they chose to participate or not.</p> <p>Of greater concern is the transparency of the NEC process. The issue’s controversy will just be ramped up with any appearance of secrecy, especially given that everyone concerned is working from the “best available science”, which should be open to public review. The intent of the</p> | | 31-2 | | | | |

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| NEC to produce a peer-reviewed paper for submission to JASA should not delay implementation of their work as a public resource, but making their product proprietary only serves to increase the controversy from secrecy. | | | | | | |
| Disclosure of the specific information used to develop and evaluate the proposed acoustic criteria is essential if the EIS process is to be a meaningful one. For example, NMFS must disclose the role of the acoustics criteria panel that was assembled by NMFS to help develop these criteria, and must also disclose all findings and recommendations of that panel. On March 3, 2005, NRDC sent a letter to Dr. William T. Hogarth of NOAA-Fisheries, expressing our serious concern that this acoustic criteria panel is operating in violation of the Federal Advisory Committee Act, and detailing our request that proceedings and recommendations of the panel be made public. That letter is incorporated herein by reference. | | 38-12 | | | | |
| Will the makeup of the panel of scientists who are advising on the criteria be addressed, including their current and past affiliations and their funding backgrounds? | 46-2 | | | | | |
| Education | | | | | | |
| In order for the program to be effective some form of outreach and education should be initiated to inform the public and effected parties about the importance of sound to marine mammals and how anthropogenic sounds affect them. For example, the availability and use of specially made maps can guide people through restricted areas. The maps would show areas of strict acoustic criteria especially if breeding grounds and migration routes have harsher restrictions. To further illustrate the new acoustic criteria, buoys and or monitoring devices could be set up to show boaters where noise restrictions are in place. These would be much like that of the no wake zone buoys and could incorporate a monitoring device to measure sound levels. | 42-4 | | | | | |
| To educate the public about the importance of sound in the marine environment, education exhibits should be made. At places like aquariums or large recreational harbors, small exhibits or even just posters could be displayed showing how sound is used in the ocean, what normal sounds levels are, how it can effect marine life, and the consequences of noise pollution. | 42-5 | | | | | |
| Training programs directed at the larger companies who are directly affected by the new laws should be arranged ensuring that industries like fishing understand and abide by these new laws. | 42-6 | | | | | |
| Another reason for an ongoing study would be the lack of current data on some of the marine mammals and even other potentially effected species. The continual study of marine | 42-8 | | | | | |

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| mammals must also include the acoustic criteria of the additional species. The Federal Register notice indicated that specific information is only know about select species, and information will be generalized to broader populations, so we feel it is vital that research to include specific species be included in the DEIS. Data for terrestrial mammals has been used since marine data was not available, the validity of the data should be studied in order for proper acoustic levels to be in place. Also, the current proposed laws are based on marine mammals, but do not mention other sea life that may be more susceptible to sound. It may very well be that more conservative criteria for marine mammals would have ancillary benefits for other marine life species. | | | | | | |
| We are concerned about the extrapolation of data assumptions for broad functional groups. We feel there is a lack of credible data to allow the impact of the actions within this proposal to move forward as currently written. Under the scoping process, we would recommend substantially more data and information to allow for full assessment of the impact of this proposed action. | 42-10 | | | | | |
| General | | | | | | |
| In support of 70 FR 1871, Redefining Marine Mammal Taking by Anthropogenic Noise; As a trained Wildlife Biologist, I strongly suspect that recent headlines depicting mass strandings are suspect to anthropogenic noise. The redefined categories based on empirical data demonstrate scientific integrity, and I see no reason why this change should not be supported. | | | | | | 5-1 |
| AWI welcomes the NMFS willingness to revise the current generic noise criteria that, since 1997, have been used to determine when a take by harassment might occur. A revision is long overdue, especially in view of: 1) the many noise related marine mammal stranding events that have occurred subsequent to the introduction of the current criteria; 2) the severe lack of understanding in relation to marine mammals and their physiological and behavioral reactions to ocean noise; and 3) the growing attention that anthropogenic ocean noise is receiving in the international arena and multiple calls for caution from respected international bodies. | | 30-1 | | | | |
| NMFS is developing new science-based thresholds to improve and replace the current generic exposure level thresholds that have been used since 1997. NMFS envisions that these new noise exposure criteria will be based on five functional hearing groups of marine mammals paired with four different types of anthropogenic sounds. A matrix will be developed of the functional hearing groups and the types of anthropogenic sounds. This matrix will embody the noise | | | 34-1 | | | |

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| exposure guidelines NMFS would use to guide determination of what anthropogenic sound level may result in an acoustic "take" by harassment under the MMPA and ESA for each of the different marine mammal hearing groups. The guidelines will be based on exposure characteristics derived from empirical data and are tailored to particular species groups and sound types. Industry supports NMFS's effort to upgrade its current guidelines using a science based approach that will undergo scientific peer review, as this approach is consistent with the "best scientific: evidence available" standard of the MMPA. | | | | | | |
| We support NMFS's efforts to establish guidelines for an acoustic impact criteria reflective of best available science however, there must be flexibility in applying the criteria, tailoring it as necessary to fairly encompass the effects of the action. | | | | | 36-1 | |
| Using the NOI to develop regulations instead of developing guidelines. Guidelines are more flexible than regulations and allow for quicker revisions to incorporate the evolution of best available science. | | | | | 36-4 | |
| If CRE's understanding that the purpose of this proceeding is to develop science-based criteria for the assessment and regulation of acoustic effects on marine animals is correct, then we applaud NMFS for its efforts. Science-based criteria in this area are long overdue. | | 47-1 | | | | |
| Over the last year, strong cautionary statements about the threat that loud ocean noise poses to marine mammals have been issued by the European Parliament, the International Whaling Commission, the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS), the Spanish government in relation to the Canary Islands, and the World Conservation Union. | 3-4,
6-5,
8-5,
17-5,
18-5,
19-5,
46-6 | | | | | |
| NMFS appears to be revising acceptable noise levels well above those that many leading scientists believe are rational. There is abundant and growing evidence, as seen in the controversy over the Navy's attempt to implement LFA and many other instances of human-caused sonic disturbance in the ocean, that the behavior patterns and physical well-being of whales, other marine mammals and, indeed, fish are being impacted negatively by the din of anthropogenic noise. | 7-1 | | | | | |
| The guidelines mention seals and sea lions as the pinnipeds. Are odobenids (walrus) included too? Also, where are sea otters and marine otters covered? | | | | | | 25-7 |
| No door is left open for stress hormone measurements to enter the decision-making process. | | | | | | 25-15 |
| In the Federal Register notice, what does "a relatively | | | | | | 25-18 |

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| conservative estimate of PTS as 40 dB of TTS” mean? | | | | | | |
| Computer advancements and visionary scientists must be capable of better and human testing using digital investigations. | 26-2 | | | | | |
| NFMS should explain the Proposal’s impact on Coastal Zone Management Act Plans to regulate underwater noise levels from human sources. Some states, including California and Hawaii, have undertaken to regulate underwater noise. NMFS should consider and explain to the public how these new guidelines will impact existing state Coastal Zone Management Plans, for example. Such a review is required by NOAA’s NEPA procedures and would be of interest to public stakeholder groups including NMMA. | | | 32-11 | | | |
| Does NMFS intent to issue permits to all vessels based on ship type, noise emitted and marine mammals along typical or potential travel lanes, and if so how would this be implemented and enforced? If not, how would the guidelines apply to ships? | | | | 45-4 | | |
| The EIS should evaluate existing and potential technologies that could attenuate or otherwise mitigate underway noise sources, including noise from vessels and marine construction activities. | | | | 45-5 | | |
| The EIS must be based on sound science and thoroughly assess the economic impacts of the proposed guidelines. | | | | 45-7 | | |
| this agency lets 100% of all who seek to destroy animals get permits to destroy them. None are prevented no matter how stupid that project or overdone the killing. | 14-2 | | | | | |
| Instead of asking how the human use of sound in the oceans must be regulated in order to protect marine mammals, the exercise appears to be one of finding out how loud we can allow the routine discharge of sound and still keep a portion of the marine mammal populations alive. As was clear in the writing of the Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.) (MMPA), this is an agenda that is guaranteed to fail in the protection of ocean creatures. | | 30-3 | | | | |
| Included as part of these comments are the legal basis behind both Environmental Impact Statements (EIS) under the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) (NEPA), and the MMPA. The Notice does not comply with NEPA because it restricts the breadth of the discussion. The whole purpose of an EIS is to look at all information, not just that most palatable to the industries being regulated. According to the Code of Federal Regulations (40CFR1502), the purpose of an EIS is to “insure that the policies and goals defined in the Act [NEPA] are infused into the ongoing programs and actions of the Federal Government. It shall provide full and fair | | 30-5 | | | | |

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| discussion of significant environmental impacts... and the reasonable alternatives which would avoid or minimize adverse impacts...” | | | | | | |
| <p>The way that this EIS and the alternatives are presented is designed to prejudice the outcome, as does the grossly inappropriate influence on the Noise Group upon whose ‘science’ these choices are based. The NMFS permitting process has become compromised by the powerful industries it is supposed to regulate. This problem was recognized when the MMPA was originally conceived: “Recent history indicates that man’s impact upon marine mammals has ranged from what might be termed benign neglect to virtual genocide. These animal, including whales, porpoises, seals, sea otters, polar bears, manatees and others, have only rarely benefited from our interest; they have been shot, blown up, clubbed to death, run down by boats, poisoned, and exposed to a multitude of other indignities, all in the interest of profit or recreation, with little or no consideration of the potential impact of these activities on the animal populations involved.” (US Congress Merchant Marine and Fisheries Committee Report 1971b: 11-12.) That which was agreed to in the MMPA was a law that would ensure that “future generations will be able to enjoy a world populated by all species of marine mammals.” (US Senate 1972a.) This lofty promise was guaranteed in the law by two built-in elemental and innovative legal features to govern future decisions: 1) building a conservative bias in favor of the species and 2) assigning the burden of proof to the party seeking to take or import the species. As originally written and intended, the MMPA held as one of its basic precepts that any party wishing to exploit marine mammals should have the burden of proof that such activity will be consistent with the Act’s overall goals and not disadvantage any species: “If that burden is not carried—and it is by no means a light burden—the permit may not be issued. The effect of this set of requirements is to insist that the management of the animal populations be carried out with the interests of the animals as the prime consideration.” (US Congress Merchant Marine and Fisheries Committee Report 1971b: 18). Now we come to this NMFS proposal to prepare an EIS which sets new criteria on thresholds at which sound might result in impacts to a marine mammal such that a take by harassment might occur. In every way the intention of the MMPA as discussed above is not being carried out and in fact has been reversed in this process. First, the administrative bias is strongly towards allowing the increased impact on marine mammals from the use of</p> | | 30-6 | | | | |

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| <p>anthropogenic sound. In case of a question of data, deference is clearly made to the applicant wishing to use the sound. Second, the burden of proof has been shifted onto the creature, and their defenders, and away from the party wishing to use noise, to prove that the use is damaging. Presently, industries using sonar and seismic instruments do not have to prove their safety, just assert unproven mitigations and continue as usual.</p> | | | | | | |
| <p>In preparation of the EIS, NEPA requires the NMFS to “consider all types of impact both direct and indirect.” We would request that the EIS include thorough discussion on the following issues:</p> <ul style="list-style-type: none"> - The direct physical impact on each type of creature from each type of sound; - How many additional times one organism is hit by the reverberation of each pulse of sound between surface and sea floor; - The effect of multiple sound events, over hours, days, and weeks; - The cumulative effect of multiple sources of sound, especially when both seismic and sonar are employed; - The depth and size of creature that would be affected by resonance at different levels of sound frequency; - The effect of long-term chronic exposure to each type and intensity of sound; - The effect of masking in altering feeding and reproductive behavior; - The effect of sound on the social behavior of each type of creature; - The effect of each type of sound on prey species; - The effect of long term chronic exposure of each type of sound to prey species, including plankton; - The conditions under which bubbles are generated in cetacean and pinniped blood; - The synergy between the effects on different species; - All of the above at different sea states, at different depths, in different temperature zones, under differing bathymetric conditions; - How the measurement of the same received sound in air differs to that measured in water; - The applicability and use of the results of studies of the chronic effects of sound on human beings, including relatively low levels of sound; - All the data extrapolation and ‘tuning’, including the reasoning to explain how the largely visual terrestrial creatures can be used in the place of ocean creatures, who are primarily sonic and therefore more sensitive to sound; - The term “science-based”, in regard to the decisions on | | 30-12 | | | | |

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| <p>what data to use and what to dismiss;
 - The socio-economic effects of the whale and dolphin watching industries;
 - The relevance of documented global marine mammal stranding incidents that have occurred coincident to anthropogenic noise events;
 - The applicability of the strong cautionary statements regarding anthropogenic ocean noise made by various international governments and bodies, including: the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (2003); the International Whaling Commission (July 2004); the European Parliament (October 2004); the government of Spain in regard to the Canary Islands (October 2004); the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (November 2004); and the World Conservation Union (November 2004); and - The current mitigation methods used in the permitting process, including an analysis of all known critiques on the effectiveness of these methods.</p> | | | | | | |
| <p>Given the extreme problems connected with this document, including the narrowing of the scope and basing the criteria on the information derived from a panel of questionable legitimacy, the Animal Welfare Institute requests that you reconsider the decision to prepare an EIS as outlined in the Notice and develop alternatives that truly address the best available knowledge. We also recommend that the process be suspended until the Advisory Committee has concluded its meetings, furnished its report and had the report's findings and recommendations accepted.</p> | | 30-13 | | | | |
| <p>Anthropogenic marine noise is a controversial subject, with growing economic, political and military influence seen as pitted against the welfare of marine mammals. The MMPA has been under increasing attack, the number of noise polluters is constantly increasing, and the tendency has been for major noisemakers to be excused from compliance rather than mitigate their noise. This EIS is viewed by some as the latest phase of this attack, an effort to increase allowable anthropogenic noise and decrease regulatory actions and oversight. Building on the history of the ATOC, LFA, LWAD, ship shock trials, pile driving, and seismic surveys, this EIS process has inherited a credibility gap. It appears to some to be aimed at allowing the oceans to be noisier, without credible evidence to support that outcome, and make it more difficult for NMFS to fulfill its duty under the MMPA.</p> | | 31-1 | | | | |
| <p>So far the only materials available for public review are various brief statements from the Federal Register</p> | | 31-4 | | | | |

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| <p>announcements, Marine Mammal Commission Noise meetings, and NMFS scoping meetings. None do more than lip service to a precautionary approach. CSI notes that, in an earlier presentation, the 2001 NRC Definition of the precautionary principle was used, ostensibly as a guideline: "If the burden of proof were to show that an action would not harm a species rather than that it would harm a species, increased protection would result. The importance of shifting the burden of proof this way ...is known as the "precautionary principle." We note that considerable worldwide attention has been given to definitions and discussions of the precautionary principle, most recently with a scientific workshop in Ecuador. CSI requests that NMFS review the precautionary principle as defined beyond the NRC. Far more importantly, CSI requests that NMFS clarify whether the agency's policy is that the burden of proof is on the noisemaker to show no harm, or on the reviewer to show harm.</p> | | | | | | |
| <p>CSI has used the definition of Biological Significance (without abbreviation) as defined by the National Research Council's 2005 "Marine Mammal Populations and Ocean Noise", as NMFS may have adopted this definition. Overall, the 2005 NRC recommendations are unrealistic, as the time and funding to complete them are not available. The recommendation for stress tests to determine impacts deserves consideration, although CSI is not implying support for the methodology.</p> | | 31-5 | | | | |
| <p>These are some reasons why CSI considers this DEIS process premature and forced. The pressures to allow more human noise rather than less are enormous and growing but, even in the face of that reality, we believe that the mandated responsibility of NMFS is better served by backing up the MMPA and stimulating needed research, rather than producing a DEIS that may lack credibility because it stretches the facts to accommodate the pressures. Underlying the process to date is the stated interest of NMFS to reduce the permitting workload and overall costs. This approach has reduced many other NMFS actions to mere shells, and must be disconcerting to the professionals involved. CSI recognizes some of the significant threats NMFS faces, including links between IWC votes and the NMFS budget. The pressures from above may be enormous, but can NMFS produce a credible and defensible EIS with the data available?</p> | | 31-12 | | | | |
| <p>We understand that the NEC intends to submit the matrix and discussion to JASA, for publication as a peer-reviewed paper. To be blunt, it is unlikely that any matrix derived from such minimal data would be accepted as the core of a</p> | | 31-13 | | | | |

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| PhD dissertation. The planned JASA paper may be appropriate as a theoretical paper, or discussion meant to stimulate better science, but it should not be construed as a working matrix for definitive management applications. | | | | | | |
| The DEIS also should call for increased acoustical impact funding by the National Science Foundation. | | 31-19 | | | | |
| The DEIS process must be set up to seek out and incorporate this flow of information in an aggressive, continual and transparent manner. It must be recognized that the entire process may be altered by some significant data becoming available at the last moment; there can be no cut-off date until the document is sent to the printer. Besides being an expansion of available sources, a forthright worldwide search effort will dilute criticisms of potential bias among US sources from funding entities. Every bit of information considered by the DEIS process also must be available for timely public analysis. As a backup, it is possible that a significant resource may be known to a commenter, but not known to the DEIS preparers. | | 31-24 | | | | |
| As one example of the latest information, CSI requests that the Report of the Subcommittee on Synthesis of Current Knowledge, Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals, be included in the DEIS process and available for public review early in the DEIS comment process. Both the MMC and NMFS should cooperate towards that goal. The Subcommittee's stated purpose is to provide the best and most current resource. It is not enough to assume that normal delays will allow this resource to be available to the public in time; it must be assured. NMFS must work with the MMC Advisory Committee to guarantee this. | | 31-25 | | | | |
| In general, NMMA supports efforts to utilize sound science and to apply new research and information to federal resource protection and management efforts. In concept, NMMA does not oppose the National Oceanic and Atmospheric Administration's (NOAA) desire to establish new "science-based guidelines" for determining an acoustic take under MMPA. We are deeply concerned, however, that the current action may be premature. There are significant data and knowledge gaps in existing research, which NOAA openly acknowledges in its Notice of Intent. NMMA has conducted a comprehensive review of the scientific literature on the auditory thresholds of marine mammals and consulted with acoustic experts. We have found that there is consensus in the scientific and regulatory community that acoustic research on marine mammals is incomplete at this time. The National Research Council (NRC), following a comprehensive review of available science in this area, | | | 32-2 | | | |

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| summarized this point quite lucidly: “existing data are insufficient to predict accurately any but the grossest acoustic impacts on marine mammals.” Therefore, NMMA strongly recommends that NOAA continue studying this issue, but refrain at this time from developing any guidelines based on woefully inadequate data. | | | | | | |
| The EIS must fully consider the impacts of NOAA’s proposed actions on the human environment, which is impossible unless and until NOAA provides specific sound exposure levels for all classes of marine mammals in the five functional hearing groups. In particular, NOAA must study how these alternatives will impact human activities, including socioeconomic impacts. NOAA guidelines and policies on NEPA define the human environment as including the “natural and physical environment and the relationship of people with that environment. . .when an EIS is prepared and economic or social and natural or physical environmental impacts are interrelated, the EIS must discuss all of these impacts on the quality of the human environment.” Central to the natural and human environment are recreational anglers. As such, a complete socioeconomic assessment is necessary in this case. | | | 32-7 | | | |
| A socioeconomic evaluation in the development of an EIS on this issue is particularly important given the size of the recreational marine industry, which is more than twice the size of the cruise ship industry, larger than the commercial fishing industry and recreational saltwater angling, and in many years even outpaces the offshore oil and gas business. Nationally, our industry supplies more than 400,000 Americans with good paying jobs, providing nearly \$7 billion in wages every year. Recreational boating also drives millions of Americans to the nation’s coastal communities for recreation and tourism annually, contributing billions in spending and sustaining hundreds of thousands—if not millions—of related jobs for people who work in hotels, restaurants, marinas, gas stations, grocery stores, and other retail shops in those local economies. Recreation and tourism is one of the fastest growing sectors of the U.S. economy, and more and more Americans are choosing the nation’s waterways as their preferred venue for relaxation and enjoyment. | | | 32-8 | | | |
| Saltwater recreational fishing, which is inexorably tied to boating, is a substantial economic force in the United States. The more than 13 million recreational saltwater anglers took approximately 82 million fishing trips in 2003, generating more than \$30 billion in economic impact and supporting nearly 350,000 jobs nationwide, something which has been acknowledged in NOAA’s new Recreational Fisheries | | | 32-9 | | | |

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| <p>Strategic Plan, A Vision for Marine Recreational Fisheries. Together, recreational boating and angling contribute more than \$60 billion a year to the nation's economy and provide nearly a million American jobs. Both constituent groups are uniquely affected by federal regulations related to the marine environment. As such, any EIS must fully assess the impacts of all proposed actions on these stakeholders specifically.</p> | | | | | | |
| <p>NMMA is pleased that NOAA has recognized the significance of its proposal to adopt new sound exposure threshold guidelines and decided to prepare an EIS. However, NMMA is particularly concerned about this agency action since it clearly will provide a precedent for future actions by NOAA, other federal agencies, and the states in managing marine noise. As such, it would be irresponsible for the Agency to take any "short cuts" by not fully explaining its proposal or by rushing to take action before the science is ready. NOAA should assess the degree to which this action will establish a precedent for future actions.</p> | | | 32-12 | | | |
| <p>If NOAA insists on pressing ahead with this proposal (either as a proposed rule or as draft guidelines), the Agency should indicate that it will be limited to use for the issuance of individual incidental take permits by NMFS on a case-by-case basis only, as is done in the status quo. Such an approach will be far more effective in terms of resource management and protection and far less onerous on the regulated community. To be accurate, any effort to assess the impact of noise on marine mammals must consider important contextual variables in specific marine environments, such as seafloor topography, ambient noise levels, water depth, and others. These new noise threshold guidelines should not be utilized for the development of blanket regulations on human activities, such as recreational boating and angling, and they should not be applied by federal agencies not in the business of issuing incidental take permits for marine mammals under the Marine Mammal Protection Act. NMMA cautions that the U.S. Fish and Wildlife Service (FWS), which manages manatees, polar bears, and sea otters under MMPA, should also not utilize these guidelines since NOAA is not developing in this agency action guidelines for these species. Such use is conceivable and is of great concern to NMMA and the millions of recreational boaters who enjoy our nation's public waterways each year. Recreational boating access, which underpins the viability of the entire boating industry, is a priority for NMMA. We are concerned that, without prior notice or scientific justification, these guidelines may</p> | | | 32-13 | | | |

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| <p>be used by federal and state agencies other than NMFS to justify restrictions on recreational boating access in federal and state marine protected areas. Such a general application of these guidelines would be inappropriate, scientifically unsound, and something that NMFS should be clear about as it proceeds.</p> | | | | | | |
| <p>One potential criticism of using masking as a measure of harassment is the lack of evidence regarding its “biological significance.” This term has entered the statutory language in recent years, and NMFS and others have been struggling to incorporate this threshold of impact into its permitting process. As I read the Notice of Intent, the current Noise Criteria process is not attempting to define biologically significant levels of noise, but rather the thresholds of Level 2 harassment beyond which biological significance needs to be evaluated in issuing permits (i.e., NMFS would still use its own biological analysis to determine whether such harassment, even if triggered, is incidental). Thus, the biological significance of masking need not be proven here, any more than equally unproven long-term biological significance of TTS or behavioral disruption.</p> <p>While NMFS is bound by the recent additions of “biological significance” to statutory language, the present exercise in seeking scientific basis for decision-making perhaps provides a valid ground to question the practical utility of the “biological significance” standard. While the desire for a concrete scientific basis for regulatory decisions is understandable—not the least in order to provide a legally-defensible standard—the need for proof which is demanded by the “biologically significant” standard seems to be triggering a slide away from the original intent of the MMPA, and indeed from the ability to make biologically sensible regulatory standards. On a practical level, it is nearly impossible to prove the long-term (and often short term) biological significance of auditory masking, behavioral disruptions, TTS, or, arguably, even PTS; indeed, anything short of cumulative deaths can fall short of meeting this standard. While the separate ongoing process to create a mathematical model for calculating the significance of repeated subtle impacts may provide a patch for this problem, it can also be rightly seen as but a heroic attempt to deal with the untenable demands that the statutory language is placing on regulators. I’m not sure what exactly the role or power of agency or academic scientists may be in addressing this problem, though if the agencies discussed the difficulty openly, rather than contorting science to try to comply, that would be a start.</p> | | | | | | 33-14 |

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| <p>This comment is just to encourage some straight talk about the perhaps unintended complications created by this statutory language, and to encourage a reconsideration of its usefulness; the simpler, if less concrete, original standards of injury and harassment are perhaps preferable to this ill-guided quest for a certainty which science is likely to find impossible to satisfy.</p> | | | | | | |
| <p>Sea otters, polar bears, walrus, manatees, and the dugong are marine mammals that are currently protected under the MMPA, and, as such, the current definition of harassment under that Act applies to these species. However, these species fall under the jurisdiction of the FWS. If these criteria will not apply to these species, we recommend explicit statement of this.</p> | | | | | 35-3 | |
| <p>A major issue in Alaska coastal waters, especially in, but not limited to, the Beaufort Sea, is the potential impact of human generated noise on the availability of marine mammals for take for subsistence uses, and on the use of areas by marine mammals for feeding. Currently, one of the conditions (specified in Section 101(a)(5)(A)(i) of the MMPA) that must be met for the authorization of the incidental but not intentional taking of marine mammals is the requirement that the total of such taking will not have an unmitigable adverse impact on the availability of taking of such species or stock for subsistence uses, as specified in other subsections of the MMPA. Unmitigable adverse impact is defined as:</p> <p style="padding-left: 40px;">An impact resulting from the specified activity that: 1) is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by (a) causing marine mammals to abandon or avoid hunting areas; (b) directly displacing subsistence users; or, (c) placing physical barriers between the marine mammals and the subsistence users; and 2) cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.</p> <p>If the criteria for what constitutes a take are changed, then the set of noise-producing actions that are subject to this additional requirement may also be modified. We recommend that the EIS specifically address how the implementation of these criteria might affect the availability of marine mammals for subsistence take by Alaska Natives. We request specific analysis of potential impacts of the implementation of these criteria for defining Level B harassment take on future procedures and decision-making related to requirements under the MMPA regarding</p> | | | | | 35-15 | |

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| unmitigable adverse impact to the availability of the taking of marine mammal species or stocks for subsistence use and potential resultant impacts on subsistence take. | | | | | | |
| While the NOI states these criteria will be used to establish guidelines for acoustic impact criteria, at the Silver Springs, MD scoping meeting, it was stated that the criteria might be used for regulation (means to establish regs). Navy recommends establishment as guidelines. As such, the guidelines should be flexible and allow for revisions reflecting the best available science. | | | | | 36-5 | |
| Definition for harassment under MMPA and ESA should be identified. A discussion as to how results developed using criteria would be used in determining whether each statutes respective threshold have been crossed. Recommend using MMPA Level B Harassment as the “may effect” threshold for ESA. | | | | | 36-10 | |
| There is no equivalent background for ESA definition of harassment. Definition of ESA harassment needs to be added if the NOI is going to address criteria for ESA harassment. | | | | | 36-11 | |
| Level A and Level B harassment are MMPA terminology. No mention is made for ESA criteria for harassment in the first paragraph of the Proposed Action. Will the same criteria be used for MMPA and ESA harassment? Paragraph 3 under Proposed Action states that it will. Recommend that information be put in the first paragraph. | | | | | 36-12 | |
| Define “brief” and “fast” with relation to sounds and rise time. Are criteria for the source or receiver? Navy scientist assert for the receiver-based criteria, based on TTS/PTS science. | | | | | 36-13 | |
| As you know, maritime acoustic activities have the potential to kill, injure, and harass marine mammals and other marine life over wide geographic areas.' Thus, we appreciate NMFS's commitment to prepare an EIS analyzing the adoption of these criteria, as the National Environmental Policy Act requires. By altering the substance of permitting decisions under the Marine Mammal Protection Act and the Endangered Species Act, governing acoustic takes of marine mammals, the new criteria under consideration would significantly affect your agency's protection of these species from the growing risks of ocean noise pollution. The new criteria would apply to all sources of anthropogenic ocean noise, from military sonar to seismic airguns to explosives to shipping, and would apply to all marine mammals. Given the significance of this proposal, it is imperative that NMFS incorporate the rigorous, objective analysis demanded by NEPA into the earliest possible stages of its planning. | | 38-1 | | | | |

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| <p>In order to satisfy NEPA, an EIS must include a "full and fair discussion of significant environmental impacts." 40 C.F.R. 1502.1. It is not enough, for the purposes of this discussion, to consider the proposed action in isolation, divorced from other public and private activities that impinge upon the same resource; rather, it is incumbent on NMFS to assess cumulative impacts as well, including the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future significant actions."</p> | | 38-2 | | | | |
| <p>The preparer of an EIS must make every attempt to obtain and disclose data necessary to its analysis. The simple assertion that "no information exists" will not suffice; unless the costs of obtaining the information are exorbitant, NEPA requires that it be obtained. If the costs are deemed excessive, then the EIS must explain the relevance of incomplete information, summarize existing credible scientific evidence on the issue, and evaluate impacts using theoretical approaches or research methods generally accepted in the scientific community. Similarly, scientific disagreement on relevant issues cannot be ignored. Throughout the document, the agency is required to "insure the professional integrity, including scientific integrity," of its discussions and analyses.</p> | | 38-3 | | | | |
| <p>An EIS must also "inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. 1502.1. This requirement has been described in regulation as "the heart of the environmental impact statement." 1502.14. The agency must therefore "rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." 1502.14(a). In addition, the EIS must include a discussion of measures designed to mitigate the project's impact on the environment. 1502.14(f). Consideration of alternatives is required by and must conform to the independent terms of both sections 102(2)(C) and 102(2)(E) of NEPA. In analyzing new criteria for acoustic takes, the adoption of which will affect permitting decisions across all waters and involving all species of marine mammals, it is especially critical that NMFS give full consideration to all reasonable alternatives for the purpose of minimizing harm.</p> | | 38-4 | | | | |
| <p>Additional consideration needs to be given species listed under the ESA. Given that there is little empirical data to support setting such criteria for the diversity of marine</p> | | 39-2 | | | | |

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| mammal taxa that exist, it is critical additional protections are afforded those species that are already recognized as being threatened or endangered with extinction. | | | | | | |
| I would like NMFS to support recommendation 20-9 of the US Commission on Ocean Policy calling for expanded research and monitoring of impacts of ocean noise on marine mammals independent from the US Navy. | | 39-3 | | | | |
| Any change to NMFS Noise Criteria that would make the incidental take standards applied during the bowhead whale migration less conservative is beyond the scope of NMFS' statutory authority. | | | 40-2 | | | |
| <p>It is difficult to determine from the NOI exactly what NMFS will do and what will result. Consider the following quote from page 1872:</p> <p><i>“Purpose of the Action</i>
 <i>NMFS will prepare an EIS to assess the potential impacts of the proposed framework for developing and implementing science-based ‘take’ criteria. The EIS will analyze the potential environmental impact resulting from implementation of the proposed noise exposure criteria to determine acoustic-based harassment of marine mammals, and alternative noise exposure criteria.”</i></p> <p>We have worked hard to try to understand this message, but have reached no conclusion. This is typical of our frustration.</p> | 41-2 | | | | | |
| Will transcripts from the Scoping Meetings be published? Are NMFS statements made at the meetings part of the record? If not, then there are a number of issues that need clarification in writing. Some inconsistencies between the NOI and NMFS statements at the Scoping Meetings were noted. | 41-3 | | | | | |
| What Animal Species Will Be Addressed in the Proposed EIS ? [Title of NOI Says ‘Endangered.’] The NOI announcement lists as subject: “Endangered Fish and Wildlife.” However, the NOI goes well beyond the ESA, and is actually focused on the MMPA for ‘protected species.’ It does not seem to cover listed sea turtles, listed fish, or sirenian. Hence, the NOI seems to start off with a quite misleading title. What ‘Fish and Wildlife’ will be covered by the EIS? | 41-4 | | | | | |
| Statements from NMFS (e.g., Mr. Payne at the NMFS-HQ Scoping Meeting) indicate that the intended regulatory status of the EIS is not known at this time. It was stated at the meeting that perhaps the results would serve as ‘guidelines’ or perhaps would be formalized for regulation | 41-5 | | | | | |

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| by 'rulemaking.' We are concerned that an academic exercise (with little basis in hard science) may turn into regulatory policy. | | | | | | |
| By the inclusion of examples of criteria and thresholds in the NOI announcement, NMFS suggests that it will establish new criteria and thresholds for impact of all types of sound sources on marine mammals in water (and pinnipeds in air). That these new results, based on 'science,' will be developed and tested in the EIS process is an ambitious goal. We suggest that to cover acoustic sources and scenarios of interest, the cost of such an endeavor could exceed millions of dollars. Does NMFS have this in their budget? In comparison, work of the NMFS Panel is estimated to have cost about \$1M (with NMFS paying part of the actual costs) – with only a few of the Panel results reflected in the NOI announcement. | 41-7 | | | | | |
| On the other hand, the regulators at NMFS-HQ have embraced an approach over the past several years that makes sense. The approach is to 'vet' criteria and thresholds through public review of formal permits (i.e., incidental harassment authorizations and letters of authorization). This has worked well for previous actions (e.g., ship shock trials, LFA, NPAL, HESS/Seismic, rocket launches) and is expected to work well for pending actions. The NMFS NOI suggests the possibility of invalidating the recent precedents mentioned. In fact, it more than suggests that the precedents established since 1997 are not based on science, but are 'generic.' This is not at all true, and is herewith challenged. | 41-9 | | | | | |
| NMFS' intention to establish 'guidelines' independent of precedent is counter to NMFS' own historically proven process. | 41-10 | | | | | |
| The Federal Register announcement is so inaccurate in its assumptions and so naive in its approach as to be viewed as a statement of a non-feasible goal. The 'permit vetting process' would then continue to be the best approach for establishing criteria and thresholds. | 41-11 | | | | | |
| We take exception to most of the statements and discussions of the NOI. There is very little that we can support, and we request that NMFS retract the NOI as soon as possible. Our objections are not based on subjective technical opinion, but rather on serious, concrete, regulatory and legal issues. Ramifications of the NOI include a significant negative impact on use of all sources of sound in water, even the most benign. | 41-18 | | | | | |
| <p><u>1) What Happened?</u>
How did the NOI get published in the Federal Register? As</p> | | | | | | |

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| discussed below and often, the NOI is seriously problematic in its: representation of the 'status quo,' new classification scheme for sound sources, unjustified selection of metrics and alternatives, basis in auditory impacts, misrepresentation of recent precedents for criteria and thresholds, misrepresentation of the state of 'science' over the past six years, and approach to funding and managing the development of the EIS. The NOI was a surprise to most. Did anyone outside NMFS review the NOI for content or implications? Were Navy or MMS or Coast Guard or DARPA or Air Force consulted? Did NMFS have an understanding of the implications of the notice? | | | | | | |
| The recommended solution to NMFS' problem is to retract the NOI, and continue with the historically successful approach for establishing impact criteria and thresholds (namely, through the permitting process and the public 'vetting' that goes with it). | 41-20 | | | | | |
| Who will prepare the EIS? Will it be done 'in house' by NMFS? Will there be outside support? Labs or contractors? Will support be determined competitively? What about conflicts of interest (for example, what if a preparer works under contract/grant part of the time for MMS or DoD)? | 41-24 | | | | | |
| The scope of the EIS appears to be quite broad. Moreover, the EIS will address regulatory policy and legal issues. Technical issues are numerous and difficult. Most of the research of interest is funded by Navy, MMS and Air Force. NOAA funds very little research on the subject matter of the EIS. On the basis of the NMFS Criteria Panel progress to date (e.g., no Level B harassment thresholds after three years of work), the draft MMS EA for the Gulf of Mexico, the CHURCHILL EIS, the SURTASS-LFA EIS, and the NPAL LOA, we would expect the NMFS EIS to cost a minimum of several million dollars and to take at least 3 years (not including any research or testing). This allows for only a minimal amount of legal support to cover response to the inevitable suits. Is funding for the whole project approved for the NOAA budget through FY 2008? | 41-25 | | | | | |
| What is the schedule for preparing the EIS and having it vetted through the public? A 2-year schedule was stated by NMFS at the Silver Spring scoping meeting. This, as noted above, is very ambitious. | 41-26 | | | | | |
| To repeat: what data and expertise will NMFS call upon to develop the EIS? The vast majority of expertise, data and experience is resident in DOD-funded investigators and labs. Might NMFS' unilateral approach to establishing legal guidelines and policy cause other agencies to limit support? | 41-27 | | | | | |

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| <p>Among the many questions we have about the NOI, one of the most important relates to timing. NMFS has a number of important actions under consideration for permits (e.g., the MMS Gulf of Mexico EIS for seismic surveys). Years have been spent in negotiation with NMFS and NMFS' consultants to determine criteria and thresholds for impact that can be justified in court. Once these actions have been 'vetted,' NMFS will have defensible precedents as we now have for single large explosives (ship shock tests), low frequency projectors (LFA and NPAL), airgun surveys (HESS), and rocket launches (e.g. Vandenberg AFB). Given the technical investigations for these and other permits and the use of the most recent science, it is curious why NMFS would announce the NOI at this time. We think this is a serious issue.</p> | 41-28 | | | | | |
| <p>The NOI announcement lists as subject: "Endangered Fish and Wildlife." However, the NOI goes well beyond the ESA, and is actually focuses on the MMPA for 'protected species.' It does not seem to cover listed sea turtles or listed fish. Hence, the NOI seems to start off with a quite misleading title. What 'Fish and Wildlife' will be covered by the EIS? Harassment criteria refer in the NOI to 'Level A' and 'Level B.' These are specific to the MMPA and do not apply to the ESA. What is intended for the ESA?</p> | 41-29 | | | | | |
| <p>Was the NOI coordinated with or briefed in advance to the seismic survey industry or the merchant fleet or DoD or USGS or manufacturers and users of fishfinders, fathometers, sidescan and sub-bottom profilers, or environmental advocates, etc.? Why are so many surprised at the timing and contents of the NOI? Why did NOAA publish numerical thresholds in an NOI?</p> | 41-30 | | | | | |
| <p>We commend NOAA Fisheries for working to replace its current policy with a more complex one that considers several variables including the type and duration of a sound and the subject marine mammals. However, we are concerned NOAA Fisheries' proposal to revamp its acoustic criteria does not go far enough to protect marine mammals from harmful sound in several respects.</p> | 42-1 | | | | | |
| <p>The "taking" of species must also be monitored and addressed in the DEIS. How NOAA determines if a minor taking – change in behavior, or a taking due to death occurs and the frequency as to this occurrence must be addressed in the DEIS. Recognizing that the entire ocean is too large to monitor, reference to taking and monitoring should be specifically addressed and expected government actions.</p> | 42-9 | | | | | |
| <p>Through the DEIS, they should fully examine and calculate the risk of assumptions and the validity of extrapolations of data. Four proposed alternatives use a new matrix of</p> | 42-11 | | | | | |

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| <p>categories which divides the current single set of standards into five functional hearing groups of marine creatures, and four types of sound sources. However, the criteria assume that all species in a functional hearing group have the same threshold apply to all species in the group. In reality, some species are so different from others in their functional hearing group that separate threshold criteria are appropriate for them. Actually there is lack of information on the hearing sensitivities of most marine species. Also, most data on the effects of noise on marine mammals come from mid-frequency dolphins. The results of studies on these species are applied directly to low- and high-frequency cetaceans without adjustment. Furthermore, in the absence of data for marine mammals, big jump like using terrestrial animal sensitivity levels as basis for setting standards on ocean species is used. Thus, for developing new criteria, further baseline scientific inquiry is necessary including habitat needs and identification of sensitive areas and seasons, status and distribution of populations, patterns of movements in various spatial and temporal scales, and role of sound and hearing in maintaining behaviors.</p> | | | | | | |
| <p>NMFS should be proposing rules that clarify the connection between anthropogenic noise and behavioral and physiological responses of marine mammals. NMFS should also keep in mind the process. The MMPA recognizes the public interest in protecting marine mammals, and outlaws conduct harmful to marine mammals. However, the MMPA also recognizes that some activities that are harmful in the short-term may be beneficial in the long run, and that some activities provide sufficient benefit to the public to be allowed. When proposed conduct falls in this middle ground, a permit is required, and the public is given the opportunity to comment on whether the benefits outweigh the costs. That is, applicants have the opportunity to ask permission before the fact rather than forgiveness after the fact. As a result, people should be advised to apply for permits in an over-protective manner. If a permit is denied, the applicant could still carry out the activity, and only face prosecution if the activity actually results in takes.</p> | | | | | | 43-3 |
| <p>While I am advocating a protectionist approach to requiring permit applications, NMFS can take a balanced approach to actually issuing permits. E.g., while I believe the law requires a permit application when even a single individual will be taken, NMFS could issue a permit based on the number of individuals it expects to be taken, the expected severity of the takes, the stock's ability to sustain such takes, and whether the expected benefit of the work justifies takes of that magnitude. I believe this is a better approach than</p> | | | | | | 43-9 |

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| <p>only requiring an application when 50% of a stock will be taken. Level A permits would be required when permanent injury is expected, whether due to the direct effects of noise or indirect effects mediated through behavioral change or increased vulnerability to predation or stranding. NMFS should be more hesitant to issue Level A permits than Level B permits. NMFS should be more hesitant to issue permits when threatened or endangered species, or depleted stocks are involved, than when healthy populations are involved. By subjecting more work to the permit process, there is more opportunity for public comment and implementation of steps to mitigate impact, even if the work is ultimately allowed to proceed. Thus the effort in the regulatory process is not wasted.</p> | | | | | | |
| <p>It is reasonable to ask applicants to consider the potential impact of their work on a stock-by-stock basis, addressing both the population status of the stock and its susceptibility to disturbance, rather than on the basis of acoustics alone. Requiring more detailed knowledge of biology is likely to be helpful, as understanding the biology allows the applicant to plan for mitigation at an early stage. The value of this can be seen by comparing seismic survey applications. SHIPS involved extensive biological review before the work was scheduled (for the winter of 1998 in Washington State), the survey was designed to have minimal biological impact, a permit was easily obtained, and the work was carefully monitored and carried out with no known Level A takes. In contrast, recent seismic surveys have been proposed where the biology was not considered in advance, the biological impact would have been unnecessarily large, and permits were not issued in a timely fashion, preventing the work from taking place.</p> | | | | | | 43-10 |
| <p>CRE understands NMFS statement (70 FR 8768, 8772 (Feb. 23, 2005)). The NMFS interpretation of the regulatory standard was affirmed by the court in NRDC s. Evans, 279 F.3d 1129, 1158-59 (N.D. Calif. 2003.) “relevant standard” is biologically significant effects on the population level. IF CRE’s understanding is correct, then CRE agrees with NMFS’s interpretation of its duty under MMPA, which will be the relevant statutory standard for most NMFS decisions regarding marine mammals and acoustic effects.</p> | | 47-10 | | | | |
| <p>To be used for regulatory purposes, the acoustic criteria should enable decision makers to assess a particular sound source’s effects on marine mammal populations or stocks. Any effect that is not biologically significant on the population or stock level (i.e., does not significantly affect the survival of the population or stock) should not be a matter of regulatory concern. Any such insignificant effects</p> | | 47-11 | | | | |

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| should at least be automatically granted "small take" authorization/permits. | | | | | | |
| NMFS should ensure that all models relevant to the acoustic criteria are sufficiently accurate, reliable and transparent to warrant their use. NMFS should also make the documentation and components of these models publicly available so that stakeholders can verify NMFS's verification of the models. The best way to achieve these goals is to establish an NMFS web site containing the necessary information. | | 47-14 | | | | |
| NMFS representatives at public meetings have given inconsistent responses to the question of whether the final criteria will be binding on NMFS decision makers. NMFS should clarify this issue by stating clearly in the Federal Register whether the final acoustic criteria will be binding on NMFS decision makers and by explaining how the criteria relate to the NMFS regulatory process. | | 47-17 | | | | |
| NMFS should develop some process that allows modification of the criteria to accommodate new data or studies that are generated after the criteria are final, but which warrant modification of the final criteria. | | 47-18 | | | | |
| Need to consider impact of proposed regulations on subsistence hunt of bowhead whale by Alaskan Eskimo. If an alternative is chosen that allows exposure of fall migrating bowhead whales to anything near 160 dB, the available evidence shows that the whales are likely to make a major "detour" around the sound. Any significant deflection of the migrating whales will negatively impact the Eskimo subsistence hunt for the whales. To get some idea of likely impacts to the subsistence hunt, the EIS preparers must consult with the hunters and their earlier noise related comments, many of which have appeared in FEIS related to offshore industrial activities in the Beaufort Sea. | | | | | | 48-2 |
| EIS preparers should carefully consider the comments of the Eskimo hunters who will be affected by proposed weakening of the noise regulations. The EIS preparers should give due weight to hunter comments and carefully consider the value of such Traditional Knowledge (TK) as it relates to the bowhead whale. Hunter related TK of the bowhead have been fully validated through at least 20 years of scientific studies (Albert 2001). | | | | | | 48-3 |
| The idea of replacing the current MMPA "Harassment Level" guideline with more closely tailored "Ocean Noise Criteria" seems like a good idea. But it is important to not craft any new guidelines too hastily. The current system is clearly lacking because it bases acceptable levels of noise pollution for all marine habitats predicated on what we | | | 49-1 | | | |

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| <p>know about the auditory perception of a few cetaceans. While this current system has served as a legislative tool to protect marine mammals from injury or death due to acoustic trauma, it has failed on a number of accounts.</p> <ol style="list-style-type: none"> 1. The current system models acceptable noise levels based on scant scientific information. 2. The current system is based in large part on organic damage to the subject animals, such as temporary and permanent threshold shifts. 3. No account is made for the synergistic and cumulative affects of noise incidents on the subject species. <p>No accommodation is made for the fact that other animals in the ocean use sound and are also subject to acoustical damage due to anthropogenic sound.</p> | | | | | | |
| The proposed NMFS action to finely tune "Ocean Noise Criteria" to specific species only embellishes the current blunt tools to suit human use of ocean habitats. This flies in the face of the U.S. Commission on Ocean Policy report recommendations to develop an "ecosystem" approach to ocean management. | | | 49-2 | | | |
| Other Case Studies | | | | | | |
| NMFS should take into consideration the mass stranding of whales along the North Carolina Coast; although unknown, suspect causes would be anthropogenic noises. | | | | | | 5-2 |
| NMFS should consider previous strandings which coincide with the use of sonar or seismic airguns: the U.S. Virgin Islands (1998, 1999), the Bahamas (2000), Maderia (2000), the Canary Islands (2002 and 2004), Baja California (2002), and the northwest coast of the US (2003). | 3-1,
6-2,
8-2,
17-2,
18-2,
19-2 | | | | | |
| The US Navy Guidance for human divers exposed to noise is a level of 145 dB SPL. According to the US Navy in their investigation into the Bahamas standing event, the level that the whales reacted to and died was 138 dB SPL. | 3-2,
6-3,
8-3,
17-3,
18-3,
19-3,
24 | | | | | |
| Events have led to the stranding and subsequent death of some beaked whale species, but are likely to be significant for other species also, including mink whales and pygmy sperm whales. Whilst at this stage very little is known about the mechanisms that led to the strandings, and whilst we acknowledge that such mechanisms will be difficult to study, they simply cannot be ignored from a management perspective. | | 29-4 | | | | |
| Some avoidance behavior and behavioral changes in surfacing was recorded under some conditions, as noted by | | 16-15 | | | | |

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| the National Research Council's Committee to Review Results of ATOC's Marine Mammal Research Program. Estimated receiving level for the humpbacks was in the range of 90 to 130 dB. Claims by researchers that the combined data show "no reaction" from whales due to these experiments was rejected by the NRC Committee. Evidence exists for some short-term behavioral changes in response to the ATOC sound source by humpback whales. | | | | | | |
| Receive EIS | | | | | | |
| I would like to receive a copy of the NMFS acoustic EIS please, as I have been unable to find it on the NMFS Acoustic website. I e-mailed the department last week to request a copy and am yet to receive a response. | | 9-1 | | | | |

The table acts as a legend to the 50 comments received to date regarding the scoping for the Marine Mammal Acoustics EIS. The number codes in the columns represent the commenter letter/e-mail (numbered 1 through 50) and the specific comment(s) presented in the letters (1+). Specific non-profit, industry, state, federal commenters are as follows:

Nonprofit

- (9) Whale and Dolphin Conservation Society
- (16) Earth Island Institute
- (29) Whale and Dolphin Conservation Society
- (30) Animal Welfare Institute
- (31) Cetacean Society International
- (38) National Resources Defense Council
- (39) Ocean Advocates
- (44) International Wildlife Coalition
- (47) Center for Regulatory Effectiveness

Industry

- (32) National Marine Manufacturers Association
- (34) American Petroleum Institute
- (37) Seaflow, Inc.
- (40) Alaska Eskimo Whaling Commission
- (49) Seaflow, Inc.
- (50) Seaflow, Inc.

State

- (46) Massachusetts Port Authority

Federal

- (35) The Minerals Management Service
- (36) The United States Navy